



The newswweekly of enterprise network computing

# NetworkWorld

**Good to GO?**

Will the FCC give Bell Atlantic the green light for long-distance service in N.Y.?

Page 14.

December 20, 1999 Volume 16, Number 51

The network portal: [www.nwfusion.com](http://www.nwfusion.com)

Business media analyst Benjamin Brimhall says streaming media is a huge money saver for Novell.



BRAD MILLIKEN

## Cisco lays out Big Blue-print

*Company begins to outline migration plan for users of IBM network gear.*

BY MARC SONGINI

RESEARCH TRIANGLE PARK, N.C. — Cisco last week began laying out a plan it hopes will encourage IBM network equipment users to migrate to Cisco gear.

In an interview with *Network World*, Cisco executives said the company soon will offer a variety of new products, including enhanced network and performance management packages as well as customer services, that should help IBM network users make the jump into the Cisco world.



Cisco's Frank Maly says new products to ease the transition from IBM to Cisco net gear should be ready by mid-2000.

Cisco's plans include:

- Working closely with IBM Global Services to develop SNA-to-IP and related voice migration services using Cisco products.
- Helping users assess the viability of current gear and outlining upgrade paths to Cisco products.
- Revamping Cisco's Inter-networking Status Monitor (ISM) to help users more effectively manage routers from mainframes.
- Arranging for IBM subsidiary Tivoli to resell Cisco-Works Blue, a network management package.
- Enhancing Tivoli's management software to control Cisco-based virtual private networks (VPN).

The migration blueprint comes on the heels of the U.S. government's recent approval of Cisco's estimated \$600 million buyout of IBM's Networking Hardware Division's

See **Cisco**, page 16

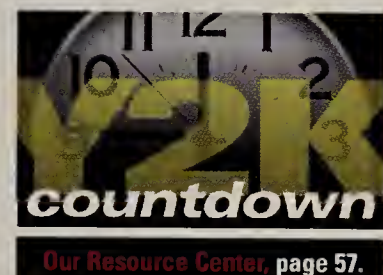
## Y2K teams: 'We're ready'

*Contingency plans abound as users face zero hour.*

BY JOHN COX AND CAROLYN DUFFY MARSAN

Even the best-prepared corporate Y2K teams cannot know exactly what will happen to their networks when the new millennium arrives. But the teams do know exactly how they will react.

That's because network professionals have left little to chance in fashioning contingency plans that spell out soup-to-nuts escalation processes for dealing with what-



ever Year 2000 bugs may slip through their best defenses.

"There will be no 'ad hoc-ness' on New Year's Eve," says Irene Dec, Year 2000 program manager at Prudential Insurance in Newark, N.J. "We have

See **Y2K**, page 56

## eToys attacks show need for strong Web defenses

BY ELLEN MESSMER

Network-based attacks against cToys last week and the emergence of a particularly destructive method for launching such raids are fresh reminders of the need for e-commerce sites to keep their defenses sharp.

Online retailer eToys has taken legal steps to prevent a Swiss art group from using the domain name etoy.com. Last week, that move prompted an

See **eToys**, page 56

[www.nwfusion.com](http://www.nwfusion.com)

### DON'T DENY IT

Read up: Descriptions of past denial-of-service attacks.

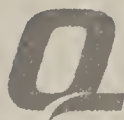
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## THIS WEEK ONLINE

**Reelin' in RFPs.** Planning for a new VPN? Need to roll out new routers? Let ITworld.com and Network World Fusion help you. With ITrfp, you can submit a request for proposal and get answers back from some top vendors. And don't worry, it's confidential. **DocFinder: 6036**



**Water Cooler.** Web site managers could learn a lot from looking at their users' surfing habits. In this week's Water Cooler, Online Editor Adam Gaffin explains how reading over the site logs can reveal some interesting information about the complexity of your site's features. He even lets you in on how a casual glimpse at Fusion's report sparked an overhaul of the site's main feature. **DocFinder: 6030**

**Work the night away.** For some of you, New Year's Eve could be filled with bells and whistles of a different sort. But you're not alone. *Network World* is working straight through the holidays to give you the most up-to-date information on the millennium bug. Head online and find out what viruses are on the prowl and how net managers are faring around the world. Also, we have links to your vendors' Y2K centers as well as the Department of Energy and the President's Council on Y2K Conversion. Spend New Year's with us. **DocFinder: 6035**

**Unified messaging.** Are you ready to gather all your messages into one bin? Lucent and Ipswitch debate whether the technology and standards are up to speed to support a single message box. What do you think? **DocFinder: 5925**

**Security first.** Handing management of your apps to a service provider may seem like a good idea, but beware. Security expert Winn Schwartau says to make sure the ASP is as concerned about safety as you are. Grill the company about its infrastructure and upgrade plans. "If you use an ASP, you should concentrate on security even more because you are extending your enterprise, broadening its perimeter," he urges. What do you think? **DocFinder: 6037**

# NetworkWorld

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## FEATURES

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Streaming media is catching on in corporate networks as an effective communications tool and an important money saver. **Page 39.**



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Automated assistants — Mercury Mobile and Webley. **Page 44.**





## NEWS BRIEFS, DECEMBER 20, 1999

**Naughton faces 10-year sentence**

Former Infoseek executive and Java visionary Patrick Naughton faces up to 10 years in prison after being convicted last week of possessing child pornography on his computer. The trial in Los Angeles centered around more serious charges — on which the jury could reach no verdict — that Naughton had used an Internet chat room to arrange a sexual encounter with a person he believed to be a 13-year-old girl. That person was in fact a male FBI agent, which led to Naughton's arrest and his dismissal from Infoseek. Naughton argued during the trial that he had presumed his chat partner was an adult posing as a 13-year-old and participating in fantasy. Several jurors apparently accepted that explanation, according to their post-trial comments, which created a hung jury that forced a mistrial. Naughton will be sentenced March 6 on the child pornography conviction, which his attorneys say they will appeal.

**Qtera fetches \$3.25 billion**

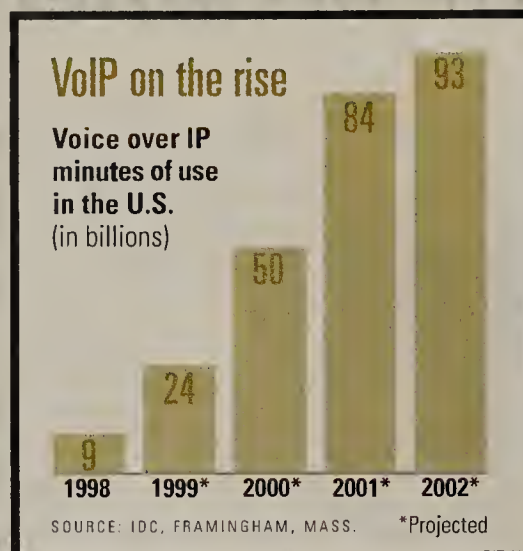
Optical network start-up Qtera Networks of Boca Raton, Fla., will be bought by Nortel Networks for \$3.25 billion, the companies confirmed last week. Nortel will use Qtera's patented technology to build long-haul network gear that supports transeontinental optical connections which require no electrical regeneration. Eliminating optical-electrical-optical regeneration using Qtera gear will save 90% of the equipment costs for carrier optical backbones. The year-old company had plans to ship products next fall.

**Development firms to merge**

Two Web development firms, USWeb/CKS and Whittman-Hart, last week announced they intend to merge in a stock-swap deal valued at about \$6 billion. USWeb/CKS has focused on developing front-end Web applications, and Whittman-Hart's forte is providing professional services for back-end integration. Plans call for Whittman-Hart chairman and CEO Robert Bernard to become president of this yet-unnamed merged company. Robert Shaw, CEO of USWeb/CKS, is slated to be its chairman of the board.

**Level 3 changes IP tune**

Next-generation carrier Level 3 last week unveiled its long-awaited voice-over-IP service but said it isn't really for enterprises after all. Called (3)Voice, the service is available on a wholesale basis to ISPs, telecom resellers and competitive local exchange carriers. Early this year, Level 3 had promised an enterprise IP voice service that would undercut big long-distance carriers' toll rates, but Level 3 officials now say they



have their eyes glued on the carrier market. Nevertheless, (3)Voice does hold the possibility for carriers to eventually offer data services with voice transport bundled in for a flat fee. That's because Level 3 uses carrier-grade call-control Softswitch software to emulate hardware-based circuit switches, in tandem with voice-over-IP gateways, to route voice streams around the Level 3 net without tying up dedicated paths for each call. One problem: (3)Voice doesn't have features such as four-digit abbreviated dialing and departmental bill-back, and doesn't yet offer basic office telephony features such as transfer and conference.

**3Com, USWeb/CKS partnering**

Meanwhile, 3Com and USWeb/CKS last week announced the formation of an alliance to develop wireless applications for the mobile workplace, as well as converged voice, video and data products. 3Com will contribute up to \$100 million in a combination of funded development and an equity investment in USWeb/CKS. 3Com had \$100 million burning a hole in its pocket after scrapping a deal with Siemens earlier this year to form a company to develop IP telephony products. 3Com and USWeb/CKS will collaborate on the development of e-business products for enterprise customers and service providers.

**Do your part: Don't call**

If you want to do your part to help save the world from Y2K on New Year's Eve, here's some expert advice: "Don't telephone anyone at midnight." That's the word from Tom Oleson, a Y2K analyst at International Data Corp. who believes that one largely overlooked Y2K problem is the "Mother's Day Danger." In other words, when everybody tries to telephone mom at the same time, the result can be an absence of dial tone. That same type of problem could well materialize New Year's Eve, according to Oleson and others.



# Network Appliance, Akamai to lead charge for wireless protocol

BY APRIL JACOBS

Network Appliance and Akamai are joining forces to develop an open protocol standard that would ease communications and improve content display on wireless devices such as cell phones and personal digital assistants with browser capabilities.

With the support of Cisco, Oracle, Network Associates and more than 30 other vendors, the goal is to submit a draft to the Internet Engineering Task Force (IETF) in early 2000.

The Internet Content Adaptation Protocol (ICAP) could represent an important step in making viewable content more use-

ful for users of browser-enabled cell phones, pagers and other mobile devices, according to industry observers. But the protocol's developers and those jumping on the bandwagon to support it may have a bumpy road ahead with the IETF.

"Obviously, there is a lot of interest in this area, but I wouldn't necessarily recommend the vendors' approach to it, because it's an area fraught with all kinds of perils," says Keith Moore, area director for the IETF's applications working groups. For example, Moore says intellectual property issues that arise in content revision and the complex nature of customizing content for devices can present problems when trying to develop protocols such as ICAP.

Also, vendor groups that submit drafts to the IETF often think their work is nearly complete when their group has reached a consensus, Moore says. But the IETF may not go along if it feels the needs of a constituency have been left out of the process.

The Network Appliance and

Akamai-led group is seeking wide-scale industry participation in developing ICAP, and is scheduled to meet Feb. 14 in San Francisco. The group hopes to have a draft for review and comment for this gathering. Network Appliance and Akamai have received endorsements from at least 31 partners, including Oracle, Novell, Network Associates, Allaire, Cobalt and Secure Computing, to move forward in developing the protocol.

ICAP would use standard HTTP, GET and POST commands in order to direct content between caching devices and network-based applications servers. James Lau, Network Appli-

ance's chief technology officer, says the protocol's simple nature will make it easily adoptable. Lau sees the protocol as a way for ISPs and e-commerce site managers to improve the way they manage content delivery by allowing better traffic management and more flexible content delivery.

Joel Yaffe, an analyst with Giga Information Group in Cambridge, Mass., says ICAP could play an important role because of its focus on intelligent caching.

"The undeniable trend is toward a significant amount of Web browsing happening over wireless devices — pagers, phones, PDAs," Yaffe says. He says vendors that make compliant devices could bolster their standing in the network. For example, content requests could be accelerated by Akamai, while routing could be improved by a vendor such as Cisco.

After the forum meets in San Francisco, it expects to have a draft to submit to the IETF's Web Replication and Caching Group. ▀

**What is ICAP?**

The proposed Internet Content Adaptation Protocol (ICAP) would let Web and application servers modify and deliver content to Internet access devices, such as cell phones and pagers with browsing capabilities.



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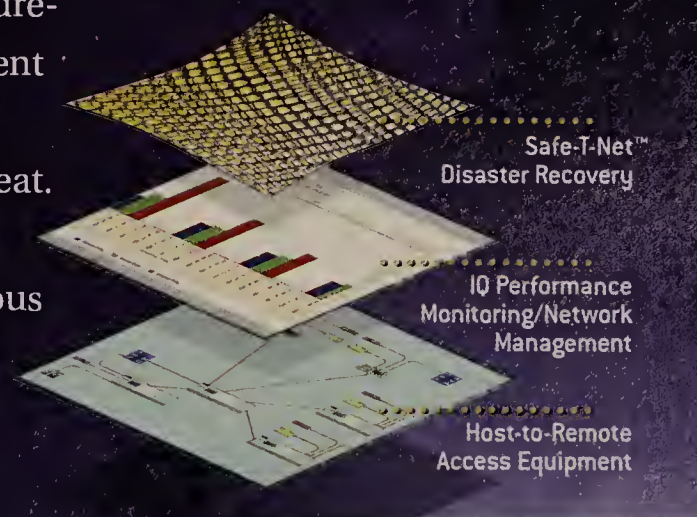
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# Microsoft details SQL Server role with Win 2000

BY JOHN FONTANA

Microsoft is betting big on Active Directory, and last week the company upped the ante as it detailed how another of its key BackOffice servers will integrate with the Windows 2000 service.

Microsoft said the next version of SQL Server, formerly called Shiloh and last week officially named SQL Server 2000, will rely on Active Directory to simplify the management of large enterprise deployments. A database server, SQL will use the directory to centralize configuration, location and maintenance information.

Earlier this year, Microsoft detailed how another BackOffice server, Exchange 2000, will be wed to Active Directory, and how Exchange, SQL and Office 2000 will be integrated into a knowledge management platform.

The moves highlight Microsoft's attempts to add substance to its product integration, which has been more concept than reality for most enterprise users.

"This year, Microsoft's at-



Windows NT

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tempt to integrate products is probably at its highest point ever," says Rob Enderle, an analyst with Giga Information Group in Cambridge, Mass. "There has always been the promise that Microsoft products would work well with other Microsoft products, but that has not always been the case. The overall effort now is to simplify the mass of products they have."

Customers are hopeful but skeptical. "Any level of integration from Microsoft is good, if in fact it works," says Julia Goldberg, global IS manager for Razorfish.com. Goldberg has a host of SQL Servers, but is delaying the rollout of Win 2000 until after the network operating system proves itself in the market.

Microsoft will face its litmus test on integration next year.

The test will include Windows DNA 2000, an integration of servers and services to create a platform for building and managing Web-based applications. The platform's key pieces are expected to ship in 2000, including Win 2000 and Active Directory; BizTalk, an XML middleware server; and AppCenter Server for load-balancing Web server farms. Microsoft also will embrace XML as a key integration tool. SQL Server 2000, for example, will support XML-based queries.

Microsoft knows tight integration is key as enterprise customers begin to rely more on distributed Web-based applications that take advantage of

legacy back ends.

With SQL Server 2000, Active Directory will serve as a central hub for registering servers, finding databases, subscribing to replication services, and keeping applications and databases in sync. When installed, SQL Server 2000 will automatically register in Active Directory, which will let database administrators search for SQL Servers and databases without knowing a location or name.

With data centralized, applications also will use the directory to find databases. Replication services will be published in the directory where administrators can search for them. ■

## WINDOWS 2000 CODE COMPLETED

It took three years, but the code for Windows 2000 is finally done.

The next and most important step comes next year when IT executives begin to deploy the operating system on the battlefields of corporate computing.

Jim Allchin, president of the platform group at Microsoft, called the completion of the operating system "the most important milestone in our company's history."

The milestone is a welcome sight for Allchin, who first handed out alpha code for the operating system in October 1996. In October 1998, Microsoft changed the name of the operating system from NT 5.0 to Windows 2000 and admitted it would be at least another year before the code was complete.

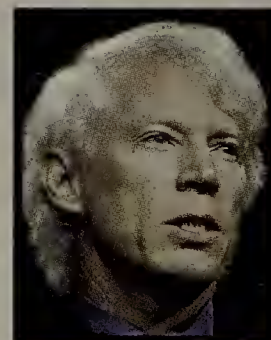
Last week, Win 2000, which includes key technologies such as Active Directory and a management tool called IntelliMirror, was released to manufacturing (RTM) in the United States, Europe and Asia. RTM is a vendor term meaning the code is final, CDs can be pressed and documentation printed.

Win 2000 will be generally available Feb. 17 in three flavors: Professional, the desktop version; Windows 2000 Server; and Windows 2000 Advanced Server. A fourth version, the high-end DataCenter, is expected to ship in June.

While the code is done, the jury remains out on its quality and the cost of upgrading.

"We won't know the real final results until the first large set of enterprise deployments," says Rob Enderle, an analyst with Giga Information Group in Cambridge, Mass.

A critical mass of deployments is not likely to happen until late next year, experts say.



Microsoft's Allchin finally has Win 2000 code out the door.

JEFF SCHIED

## More breaking news

Network World Fusion now has more news than ever. Check out these stories online:

### Y2K chief warns of dormant date-change problems

The government's top Y2K guru is warning that many problems will not appear until weeks after the actual date change. Y2K expert John Koskinen, in fact, does not expect a whole heap of bad things to happen Jan. 1 — just afterward. **DocFinder: 6038**

### Report: Majority of water, sewage utilities not Y2K-ready

Y2K stinks! That's what a lot of us might be saying if a recent report is to be believed. A couple of watchdog groups claim that most sewer and water utilities aren't ready for the new year. The sewer utilities, however, say the critics are full of it, and the water utilities claim the findings are all wet. **DocFinder: 6039**

### 1/1/00 digital certificate expirations could cause headaches

With Y2K fast approaching, chances are you've already run through your shop pretty thoroughly. Operating systems — check. Applications — check. Switches, hubs, routers — check, check, check.

But what about your digital certificates? A lot of these are supposed to expire Jan. 1, and if they are not renewed, well, you have a problem. In fact, the root certificates from VeriSign, AT&T and GTE Cybertrust are all set to expire in 17 days. **DocFinder: 6040**

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# Network Alchemy branches out beyond VPNs

BY TIM GREENE

SANTA CRUZ, CALIF. — Network Alchemy is conjuring up more than just failure-resistant virtual private networks (VPN).

The company's flagship Cryptocluster servers already share VPN processing among themselves. If one fails, the others pick up the slack without

dropping any VPN tunnels.

Next year, Network Alchemy will remix these load-balancing and failover features — called IP Clustering — to deliver products that manage IP traffic entering high-demand server farms.

Network Alchemy says the new devices will improve server-farm performance

through intelligent load balancing, while providing failover support that does not disrupt ongoing transactions.

These IP clustering capabilities are attractive to Hayes Computer Services, which runs VPN services for the state of Florida. "I can't afford [the VPN gear] to fail, because it sits in front of our entire net-

work," says Mike DeShazo, director of advanced network services for Hayes.

Network Alchemy will have to prove it can make the devices work reliably in environments where servers are getting tens of thousands of hits at a time, says John Morency, an analyst with Sage Research in Natick, Mass.

IP Clustering comes with an underlying operating system for the devices, called Alchemy OS. Servers clustered behind Network Alchemy devices appear as a single IP address on a network, making management easier. If one clustered server fails, the IP address for the cluster remains valid, negating any need to update routing instructions throughout the network.

The failover feature also allows shutting down indi-

vidual servers for maintenance without disrupting service to users.

In the future, these capabilities will be able to be applied to other applications, such as IP-voice servers, according to Jerry Jeffries, vice president of Network Alchemy. For example, if a voice server protected by a Network Alchemy device fails, other servers in the cluster could pick up the calls. The people talking would notice no more disruption than the pauses mobile phone users hear when they move from one cell to another, Jeffries claims.

The shift away from a pure VPN focus is an effort on the part of Network Alchemy to make wider use of Alchemy OS. The company hopes to demonstrate its traffic-shaping technology at Interop next spring and ship the product in June. Network Alchemy hopes its solutions will convince people that the company is a good investment — in time for an initial public offering next fall, Jeffries says.

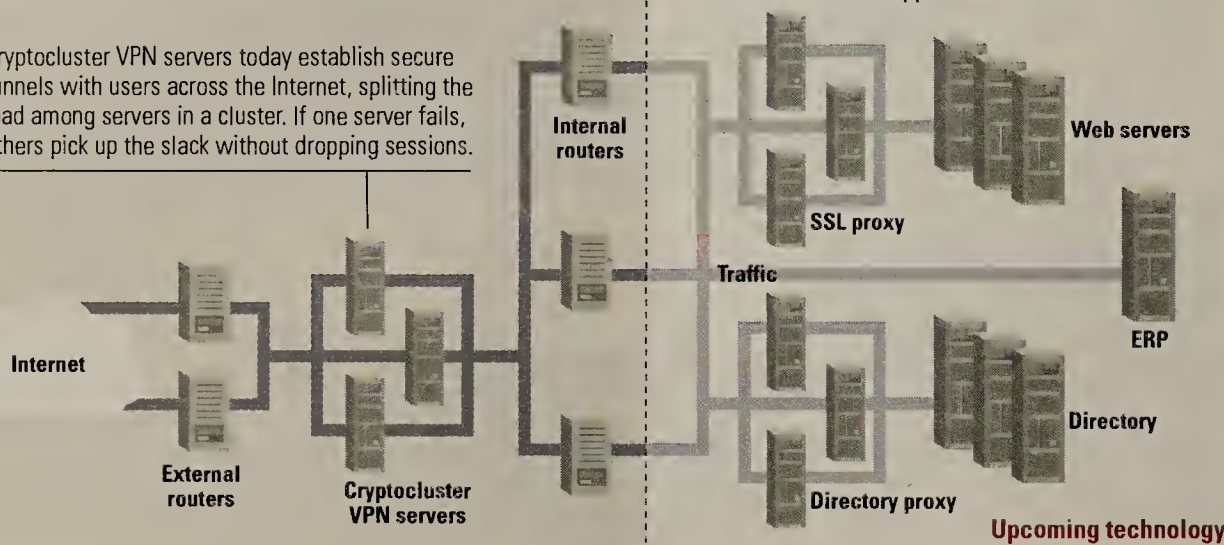
Network Alchemy: [www.network-alchemy.com](http://www.network-alchemy.com)

## Network Alchemy to keep things running

Network Alchemy is pushing load-balancing and session failover capabilities beyond its initial VPN gear.

1 Cryptocluster VPN servers today establish secure tunnels with users across the Internet, splitting the load among servers in a cluster. If one server fails, others pick up the slack without dropping sessions.

2 Next year, Network Alchemy plans to extend these load-balancing and failover capabilities to a traffic flow manager that directs IP streams to servers based on source, destination, application and other factors.



## A dose of open source realism

Industry supporters discuss the state of Linux in the enterprise.

BY PHIL HOCHMUTH

NEW YORK — It's easy to get overzealous about the potential of open source software these days, but even some of the technology's biggest proponents last week said they expect the software to make steady rather than sweeping gains in enterprise networks.

The Bazaar conference attracted a host of the industry's biggest names, including Red Hat CEO Bob Young, Corel CEO Michael Cowpland and open source advocates Richard Stallman and Eric Raymond. The conference attracted hoards of pony-tailed, T-shirt-wearing developers and engineers, as well as bearded elder statesmen of the open source community who stood in stark contrast to the nattily attired

executives attending a snazzier e-commerce conference in another part of the Jacob Javits Center.

During his keynote presentation, Young noted that Linux, Apache and other open source software products have quietly made their way into corporate networks in recent years thanks to the many types of developers and engineers attending the conference. However, he said that open source software is still awaiting the approval of high-level IT executives.

"MIS directors, by their job description, are conservative, because their primary mission is not to screw up," Young said. "If they find a solution that saves their company some money, that's a small win. If they screw up, it's exponentially a



John Hall supports open source but says Linux won't make it to many larger enterprise nets.

much larger loss."

John Hall, another open source supporter, also put the adoption of Linux in enterprise networks into perspective.

"Some Linux people won't like that I'm saying this, but you won't find Linux running on a lot of larger enterprise networks, simply because of its limited processor scalability," said Hall, who is executive director of Linux International, a non-

profit vendor organization.

"Linux will not show up in some businesses where a system has to be up 24-7 — businesses that have traditionally used systems from companies like Tandem and Sequent," added Hall, who noted that Linux does not scale past 12 processors.

According to Hall, high-availability technology and administration features that many enterprise networks require just aren't there yet with Linux.

"Linux is very stable and can stay up for a long period of time, but it is also still very hard to administer," he said. "It still takes a long time to do some tasks, like expand the file system. That can involve a lot of downtime that many businesses would find unacceptable."

Others at the conference also acknowledged that open source technologies can be powerful, but they added that the technologies don't address all enterprise network needs.

"Open source software is just going to keep creeping in, but nobody's going to make a wholesale replacement of their systems with open source solutions," said Bazaar attendee Rudy Pawul, a systems administrator for ISO New England, the company that manages the electrical power grid for New England.

Still, Pawul said he couldn't do his job without open source software, noting that he uses Apache Web server and Linux systems as file servers and Domain Name System servers in his network.

"Open source software is just better and faster than lots of commercial software that's on the market," he says. "I don't know anyone in my position who doesn't use it somewhere in their job." ■

**Open source software service and support offerings boom. Page 32.**



# SPIN

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# Bell Atlantic may get long-distance nod

BY DAVID ROHDE

WASHINGTON, D.C. — The Federal Communications Commission this week is likely to provide the first chance in nearly 16 years for users to employ a regional Bell operating company for long-distance service.

The FCC is expected to give at least partial endorsement of Bell Atlantic's application to provide long-distance services for businesses and residences in New York State. Network managers in New York generally say they'd applaud a "yes" vote by the five-member commission, because it would end excuses by Bell Atlantic that it can't carry traffic beyond local boundaries.

The FCC is required to rule on Bell Atlantic's application by Dec. 28 — 90 days after it was first filed — but agency officials have been putting out the word they will try to vote before the Christmas holiday.

RBOCs have been barred from carrying long-distance traffic since they were created in the original AT&T divestiture

in January 1984.

Unlike past applications by RBOCs — all of which the FCC turned down — Bell Atlantic's application is "highly likely" to be approved, said a note to investors sent out last week by the Legg Mason Precursor Group. Legg Mason analyst Scott Cleland in Washington, D.C. noted the "complete absence of traditional negative signals from the FCC," such as commissioner statements that the application needs more work.



FCC Chairman William Kennard is keeping mum on the vote.

FCC Chairman William Kennard has refused to tip his hand on the vote. But the New York Public Service Commission recently submitted a report to the FCC showing that Bell Atlantic completes the switchover of local competitors' orders on time 93% of the time — a key metric for the FCC to decide whether Bell Atlantic is ready for long-distance.

Users last week said they are looking for RBOCs to break their local boundaries to create more competition for end-to-end services. George Sullivan, senior network architect at

Northrop Grumman in Bethpage, N.Y., says he's examining bundles of local and long-distance services for smaller offices using digital subscriber line (DSL) access.

But while AT&T and MCI WorldCom have talked about DSL projects and competitive DSL carrier Covad has entered the local market, Bell Atlantic is "more credible than the other vendors because they have the wires," Sullivan says. Bell Atlantic has a lot of work to do to clean up its copper plant, he adds, but long-distance authority would give the company more incentive to do so.

Other users say the New York application won't mean much until Bell Atlantic gets long-distance authority in its other states.

"Bell Atlantic has the potential to become the vendor of choice from Maine to Virginia, but only if they can radically remake themselves in terms of marketing structure and rates," says Ellen Van Cleve, first vice president of the Communications Managers Association, a New York-based user group. "They need to be able to treat all company locations within their territory as a single entity for the application of discounts." ■

## Even Santa has a .com

*Site's load balancing keeps users in festive spirit.*

BY JEFF CARUSO

NORTH POLE — With all of the hubbub surrounding e-commerce this holiday season, you would expect an address like [www.santa.com](http://www.santa.com) to be a busy place.

Santa.com is expecting a rush, too. It prepared for a heavy shopping season late last month by installing two switches to balance traffic loads among a half-dozen Sun servers. So far, the site is averaging 100,000 hits per day, says Brent Ayers, director of engineering and operations at Holiday Channel, which runs the site.

"We're hoping to get in the

million-hit [per day] range by Christmas," he says.

Santa.com is aimed primarily at working women with children, Ayers says. Visitors can buy gifts online, send online cards, get recipe ideas, and write letters to Santa.

Last year at this time, Holiday Channel had a very minimal operation. The company didn't advertise Santa.com, so volume was low, Ayers says. Still, from word of mouth and people guessing "santa.com," the site peaked at 75,000 hits in one day last year. All the requests were handled by a single Sun Ultra

60. The experience gave the company an idea of the expected traffic pattern for this year.

Holiday Channel has Sun E250 and E450 servers connected to Alteon WebSystems ACEdirector 3 server switches through 100M bit/sec Ethernet links. As requests come in, the switches distribute them to the servers in a simple, round-robin fashion.

The switches also perform some packet filtering, so the site doesn't require a separate firewall, Ayers says. The switches allow just Web traffic and Secure Sockets Layer traffic in, while blocking everything else.

So far, the setup really hasn't been challenged, and Santa.com appears to be ready for the real holiday crunch. "The Suns aren't even breathing hard," Ayers says. ■



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The news  
behind the  
news

## RBOC LONG-DISTANCE: ITS AFFECT ON YOU

**G**et out your contract with your primary long-distance carrier and check the expiration date. That'll help you determine how much a possible government approval of Bell Atlantic's long-distance application will affect you. Experts agree that if you have to sign a new voice or data contract next year, Bell Atlantic's long-distance breakthrough in New York may not help you all that much. But beginning in 2001, contracts for carrier service could look dramatically different as a result of this change in the telecom landscape.

Under the Telecommunications Act of 1996, a regional Bell operating company must apply for long-distance authority separately for each state in its territory. The Federal Communications Commission must then determine — again, one state a time — whether the RBOC has met a 14-point checklist for opening up its local market to competitors. The FCC also must determine whether the RBOC has an actual "facilities-based" competitor in the state (not a problem for Bell Atlantic in New York) and decide whether it's in the "public interest" for the RBOC to enter long-distance. Only then can the FCC give thumbs up to the application. Bell Atlantic's New York bid is only the fifth the FCC has had the opportunity to rule on since 1996, and the only one before the FCC right now.

Even if the FCC says yes to Bell Atlantic this week, a wave of new state long-distance applications by all the RBOCs is not likely to happen right away. For one thing, Bell Atlantic boosted its New York prospects when it agreed to allow an independent party — accounting and consulting firm KPMG — to test its electronic ordering systems for local competitors. The FCC is likely to insist that such testing occur in other states prior to long-distance applications.

For another thing, some RBOCs are waging a separate lobbying campaign on Capitol Hill that would change the rules. Several bills — including one sponsored by presidential candidate Sen. John McCain (R-Ariz.) — would let RBOCs carry long-distance data traffic without having to go through the FCC's 14-point checklist process. To the extent RBOCs see this lobbying campaign paying off, they may hold off on FCC long-distance applications.

Even if many new long-distance applications do materialize, enterprise-network services may not top the RBOCs' long-distance wish lists. In recent months, AT&T has dramatically stepped up advertising in New York for bundles of local and long-distance residential service over ordinary telephone lines. The carrier is expected to do the same anywhere it sees an RBOC long-distance application with a chance of approval. Bell Atlantic may attempt to set up statewide frame relay offers or get deeper into the Internet backbone, but countering AT&T for residential telephony will clearly be Job No. 1. In the short term, Bell Atlantic is likely to continue using network-to-network interfaces with carriers such as Intermedia for enterprise services.

Like so much in the telecom industry, all this will change if AT&T succeeds in its giant cable bet. AT&T recently told Wall Street analysts that in 2000 it will boost its number of cable modem and telephony-ready cable customers across the country from the current 100,000 to about 3.5 million — or 6.5 million if the FCC lets it buy MediaOne. If AT&T's numbers come close to panning out, all RBOCs will probably have little choice but to move aggressively to get into voice and data long-distance for 2001 — or see AT&T eat their lunch in state after state.

— David Rohde





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**Cisco,**  
continued from page 1

(NHD) routing and switching business (NW, Dec. 13, page 1). The buy effectively rendered Big Blue's routing and switching gear obsolete.

Despite having the option, Cisco has expressed no interest in incorporating any specific IBM network technology into its lineup — which makes users such as Carl Brandt nervous. Brandt is a network administrator at Louisiana State University at Baton Rouge.

The university's ATM backbone is heavily dependent upon IBM's 8265 and 8260 switches to support a variety of traffic. Brandt figures his IBM ATM products are as good as dead, although he hopes Cisco will support them — along with IBM's other technologies.

Specifically, Brandt fears losing IBM's Multiprotocol Switched Services (MSS) server technology, which runs ATM, IP and IPX traffic in an ATM network. MSS may have no parallel in the Cisco product lineup, Brandt says. Moreover, he doesn't want his shop to become totally dependent on one vendor.

"Cisco needs to look at this as a tremendous opportunity. They can either really come out shining or really irritate a lot of people," Brandt says. "It's a chance to make some points with the non-Cisco users."

It is this type of user Cisco has to please in order for the deal to succeed.

With this in mind, Cisco is scrambling to tie itself closer to IBM. For example, about 50 Cisco employees are working on better ways to communi-

cate with IBM. Cisco also says it is working closely with IBM's massive IBM Global Services division, which will be free to design and implement Cisco-based networks to a degree that wasn't allowed before the deal. The idea is to develop services that will help users migrate to Cisco IP and voice-over-IP products.

In addition, Cisco sales representatives will work with existing IBM sales personnel on sales calls. "We're not

suggest possible Cisco alternatives to the IBM equipment (see graphic). Because it might take two or three years to complete the migration of a customer, there will be interim fixes for users who want to hang on to their gear, Cisco's Maly says.

On the product side, Cisco will revamp ISM, a mainframe-based software tool for monitoring routers. With the upcoming changes, ISM will perform three times faster than today's package, and net-

## 3COM, CISCO BOLSTER VPN GEAR

In an effort to harness high-bandwidth broadband and ATM access services, Cisco and 3Com last week broadened their virtual private network (VPN) offerings.

Cisco announced that it now offers IP Security and Cisco Secure Integrated Software — formerly known as the Cisco IOS Firewall feature set — with firewall, intrusion-detection and digital certificate support on a suite of router platforms. These platforms include the Cisco 1400 series digital subscriber line (DSL) router, the Cisco uBR924 cable access router and the Cisco 800 series ISDN router.

Cisco's 7100 and 7200 routers, which can function as central-site VPN termination systems, also now support Point-to-Point Tunneling Protocol (PPTP) clients and Microsoft point-to-point encryption (MPPE). This support lets remote access users with Windows 95, 98 and NT clients more easily set up VPNs using Cisco gear, Cisco says.

Cisco also rolled out two new models within its Cisco 7100 series of VPN routers — the Cisco 7140-8T and 7140-2FE. The 7140-8T features an integrated eight T-1/E-1 WAN interface; the 7140-2FE is a dual Fast Ethernet box designed for VPN tunnel termination behind the WAN edge, enabling enterprises to deploy VPNs without replacing or adapting their existing WAN edge devices.

Lastly, Cisco ported its NT-based VPN security software — Secure Scanner, formerly known as NetSonar — to Solaris.

All products are available. The Cisco 1400, uBR924 and 800 routers start at \$1,495, \$899 and \$799, respectively. The Cisco 7100 series of routers with PPTP and MPPE support start at \$11,900. A single license for the Solaris operating environment version of Cisco Secure Scanner 2.0 is \$495.

### Meanwhile over at 3Com

3Com announced two additions to its PathBuilder S500 series VPN switches.

The new PathBuilder S574 and S578 switches are central-site devices that support PPP over ATM. This support lets enterprise customers terminate several thousand logical connections from xDSL access devices. The connections may then be transported using standards-based Layer 2 Tunneling Protocol tunnels across public/private IP networks to another PathBuilder S500 or standards-based L2TP tunnel server, 3Com says.

Both switches feature two ATM ports running at DS-3 and OC-3 rates, and frame-to-ATM interworking for ATM access to frame relay networks.

This feature piqued the interest of 3Com customer St. Vincent's Hospital in Birmingham, Ala.

"We're leasing T-3s from BellSouth off an OC-3 ring," says Jack Gammon, LAN/WAN analyst at the hospital. "But we're not really doing native OC-3 to the WAN right now. The capability would be a perfect fit for us, as we've got a couple more hospitals that we're going to bring online that are in different parts of the metropolitan area."

For users running mixed Ethernet and ATM networks, the new PathBuilder switches combine ATM emulated LAN routing with Ethernet 802.1q virtual LAN routing in a single platform. The PathBuilder S574 and S578 switches can also extend tunnels into different LAN administrative domains or out over the WAN, a feature that's designed to provide more secure access to corporate applications.

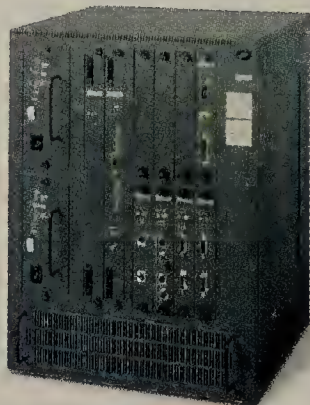
The PathBuilder S574 supports single-mode fiber and costs \$18,995. The PathBuilder S578 supports multimode fiber and costs \$17,995. Both products are available now.

— Jim Duffy

### Moving on: Possible migration scenarios

A quick guide to migrating IBM network gear to Cisco equipment:

If you have an IBM:	You might consider migrating to a:
Nways 2216 IP router/switch	Cisco 7200, 7500
Nways 2210, 2212, 2215 IP routers	Cisco 1600, 2500, 2600, 3600, 4700, 7200, 7500
Nways 8210, 8260, 8265, 8285 ATM switches	Catalyst 2900, 3900, 5000, 6000, 8500, LightStream 1010
Nways 8271, 8371, 8275, 8274, 8277 Campus Ethernet devices	Catalyst 1900, 2900, 3500, 4000, 5000, 8500
Nways 2220, 8265 WAN switches	Cisco IGX, BPX, MGX, Catalyst 8500



Nways 2216 IP router/switch



Cisco 7500

going in and replacing the IBM sales team," says Frank Maly, head of marketing for Cisco InterWorks Business Division. Cisco representatives will go to IBM accounts and offer their gear as a replacement for existing devices, he adds.

"We've got some agreed-upon rules of engagement," says Towney Kennard, a vice president with IBM.

IBM will continue to support its existing network gear for years, adds Rob Zimmer, an NHD executive. Some customers intend to proceed with IBM-based network implementations despite the sale of NHD, he notes. "When a customer makes a decision like that, they don't rip out the gear lightly," Zimmer says.

For customers who are interested, Cisco will conduct a network assessment and

work professionals will no longer have to go through a Cisco Native Service Point monitor to gather network statistics. The package will help IBM users manage mixed Cisco/IBM gear networks. The rollout of the new version of ISM should be available by the middle of 2000, Maly says.

Cisco has already begun taking advantage of IBM's Tivoli subsidiary. For example, IBM users can now buy Cisco's management products, called CiscoWorks Blue, from Tivoli. Maly says the two companies will also work to develop Tivoli software that will make it easier to manage VPNs and other Cisco gear. Exact product plans are still being worked out, he says. ■

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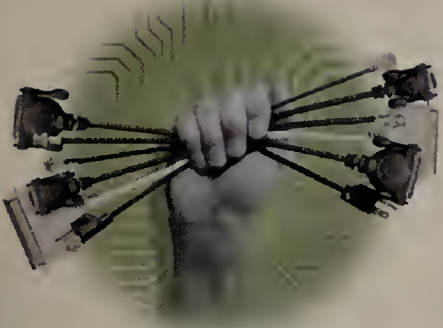
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# Infrastructure

**TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage**

## Briefs

Attempting to dispel long-standing concerns that the server giant is not fully committed to its 64-bit Alpha microprocessor technology, **Compaq** last week invested \$500 million in the chip architecture. Compaq teamed with **Samsung** and Samsung's subsidiary, **Alpha Processor**, to pump the money into a variety of projects, including semiconductor manufacturing and increased application development funding for Alpha, particularly in the Linux arena.

Compaq: [www.compaq.com](http://www.compaq.com)

**3Com** and **Unisys** last week announced an alliance to jointly sell consulting services to help enterprise customers build and manage large networks. Under the deal, 3Com's consulting arm will work with Unisys' on joint network projects. According to 3Com, customers will have the option to outsource some or all of their network management work to 3Com and Unisys. Networks will be hosted in Unisys data centers with support provided by 3Com.

3Com: [www.3com.com](http://www.3com.com);  
Unisys: [www.unisys.com](http://www.unisys.com)

Phone support and a private newsgroup set up for customers of **Microsoft's** Windows 2000 Corporate Preview Program (CPP) will end this month when the company releases the final code of the software to manufacturing. CPP provided customers with five desktop licenses, two server licenses and telephone support. CPP customers, however, will be eligible to order Win 2000 release evaluation code. Win 2000 Professional and Server are bundled together for \$14.95, with Advanced Server costing an additional \$9.95. The evaluation code is time-sensitive and must be upgraded to release code within 120 days of installation.

## NASA-funded software aids reliability

BY CAROLYN DUFFY  
MARSAN

Following in the footsteps of Tang and Teflon, the latest technology to be commercialized from the space program is software that lets network professionals distribute Internet gateway applications such as firewalls across a cluster of processors to boost reliability.

Called the Redundant Array of Independent Nodes, or RAIN, the software was developed by scientists at the California Institute of Technology (Caltech) under contract with the National Aeronautics and Space Administration's Jet Propulsion Laboratory (JPL) and the Defense Advanced Research Projects Agency. In a late '90s spin on the classic

NASA technology transfer story, the RAIN developers this month secured \$15 million in venture capital funding to bring the software to enterprise customers.

Led by Caltech professor Shuki Bruck, the RAIN research team in 1998 formed a company called Rainfinity. Rainfinity, located in Mountain View, Calif., is already shipping its first commercial software package derived from the RAIN technology, and company officials plan to release several other Internet-oriented applications.

"We want to tell the world that we have very credible technology. It's rocket science for the Internet," says Bruck, Rainfinity's chairman. "We also want it known that we have real products and real customers. And now we have the backing of very prominent venture funds."

The RAIN project was started four years ago at Caltech to create an alternative to the expensive, special-purpose computer systems used in space missions. The Caltech researchers wanted to put together a highly reliable and available computer system by distributing processing across many low-cost commercial hardware and software components.

To tie these components together, the researchers created RAIN software, which has three components:

- A component that stores data across distributed processors and retrieves it even if some of the processors fail.

- A communications component that creates a redundant network between multiple processors and supports a sin-

See **RAIN**, page 22

## Link aggregation may not deliver bandwidth promise

BY JEFF CARUSO

With link aggregation, adding two and two sometimes falls a bit shy of four.

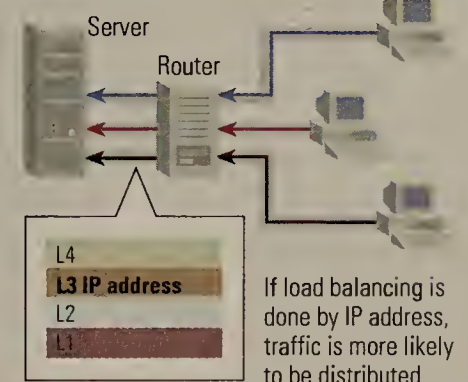
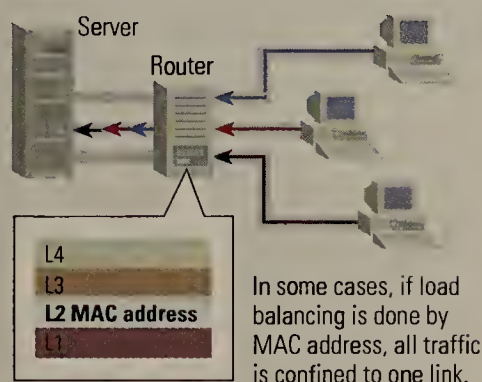
Link aggregation is supposed to give LAN connections incremental bandwidth increases. However, some network professionals may find the technology does not provide the aggregate bandwidth they'd expect, depending on how vendors implement the technology.

With link aggregation, several Fast Ethernet or Gigabit Ethernet lines are grouped into a single logical link between two devices. Link aggregation can make LAN connections more resilient — if one of the lines in the trunk fails, the other lines can pick up the traffic. Vendors also offer the technology as a way to add bandwidth to a Fast Ethernet connection without making a wholesale upgrade to Gigabit Ethernet.

But the way a vendor implements link aggregation can dramatically affect how well traffic is distributed among the lines. Some vendor algorithms look at media access control (MAC) addresses to determine which line to put traffic on. That is,

### The best use of bandwidth

With link aggregation, the load-balancing technique can affect how well links are used when clients are on different IP subnets.



packets with different source MAC addresses will be placed on different links in the trunk.

The problem with using MAC addresses is that sometimes the MAC address is always the same. Say a server is hooked up to a switch via four Fast Ethernet lines, and clients accessing the server are on different IP subnets communicating through the router. The MAC address that is used will be the address of the router, which means that all the traffic will use just one of the links. If traffic exceeds 100M bit/sec, packets may be dropped.

That's the situation facing John Sasso, a systems administrator for Logic Technology, an IT consulting firm in Schen-

tady, N.Y. The developers on staff keep their files on central file servers, which use Cisco's link-aggregation technology, Fast EtherChannel. The files are important to the company, so redundancy is required. But Sasso says only one of the four links is ever used at one time.

Cisco is aware of the limitation and has addressed the problem this year in its high-end Catalyst 6500 switch, says Marty Collins, manager of technical marketing at Cisco. Lower-end versions of the Catalyst line, including the popular Catalyst 5000 series, still use the MAC-address-based system. Collins says more models are likely to be upgraded to the

See **Links**, page 22

### High-speed LANs

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[AND ITS IMMUNE SYSTEM IS A WONDER OF NATURE.]

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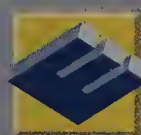
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- 64MB 100MHz ECC SDRAM (up to 1GB)
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**RAIN,**  
continued from page 19

gle, uniform way of connecting to any of the processors.

- A computing component that automatically recovers and restarts applications if a processor fails.

The RAIN software was delivered to JPL's Center for Integrated Space Microsystems, where it has been running for several months.

"The RAIN system is performing very well," says center director Leon Alkalai. "We are interested in RAIN because we are interested in reliable, distributed systems for space applications. . . . For us, it's a wonderful thing when there's a dual use of a technology that we've funded."

Alkalai says the RAIN software would be useful on the space station or space shuttle, where astronauts each have their own laptops that could be strung together to behave as a single, reliable system for certain applications.

"The RAIN software is doing exactly as we expected it to do," Alkalai says. "You can turn off computers and

## PROFILE: RAINFINITY



**Headquarters:** Mountain View, Calif.

**Founded:** Summer 1998

**Products:** Rainwall, a gateway cluster that provides server load balancing; Rainweb, a fault-tolerant Web server cluster (under development).

**Funding:** Recently received \$15 million in second-round venture funding from New Enterprise Associates, Menlo Park, Calif., and Alloy Ventures, Palo Alto, Calif.

**Employees:** 10

**Web site:** [www.rainfinity.com](http://www.rainfinity.com)

unplug switches, and the system will still be up and running as a connected system."

After delivering the RAIN software to JPL, Bruck and four of his colleagues secured a patent on it and created Rainfinity to develop commercial applications. Under an agreement with Caltech, Rainfinity has exclusive

rights to the RAIN patent and software. In return, Caltech has an equity position in the company.

"We felt the RAIN technology could have an impact on many different applications in the Internet infrastructure," Bruck says.

"People are not willing to tolerate downtime in the Internet. And they want to be able to scale applications. These are some of the same requirements as in space," he says.

Rainfinity is shipping its first product, Rainwall, which is software that runs on a cluster of PCs or workstations and creates a distributed Internet gateway for hosting applications such as a firewall. When Rainwall detects a hardware or software failure, it automatically shifts traffic to a healthy gateway without disruption of service. Rainwall runs on up to four Windows NT or Solaris systems and supports Check Point Software's FireWall-1.

Rainwall is used by BellSouth, the Chicago Stock Exchange and Dresdner Bank Group. Rainwall costs \$5,000 to \$20,000, depending on the number of processors supported. ▣

**Links,**  
continued from page 19

new system but wouldn't say when.

The new approach is to distribute traffic among the lines by looking at IP addresses. This way, traffic from clients on different subnets will travel on different lines in the trunk.

3Com's link-aggregation technology already uses IP addresses, says Cam Cullen, senior technical marketing manager at 3Com. The system will often send requests in on one link and replies out on another, he says. 3Com's algorithm also looks at the whole address.

Cisco's algorithm only looks at the ending bits of the address — the last two bits in the old system — and the last three bits in the Catalyst 6500, Collins says. Sasso points out that this could work well, as long as the last bits of addresses vary widely. If the addresses end the same way, the traffic won't be distributed well across the lines, he says.

The upcoming standard for link aggregation, IEEE 802.3ad, doesn't specify how to distribute traffic among the links. The actual algorithm is left up to individual vendors. ▣



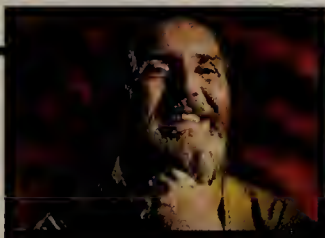
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# Information is





Wired Windows . Dave Kearns

## TAKING STOCK OF '99 AND WHAT 2000 WILL BRING

**A** year ago I predicted 1999 would be "The Year of the Directory," and I got it right (NW, Dec. 21, 1998, page 22). Years from now, we'll look back at 1999 as the year the directory took over the network arena.

The only thing I got wrong was the release schedule for Microsoft's Active Directory (part of Windows 2000), which now has been put off until February. That doesn't change the accuracy of the prediction, though, because waiting for a solid, robust Active Directory would take us well into 2001 and the anticipation of Active Directory was enough impetus to get all the directory players moving quickly throughout 1999.

I also didn't foresee the rise of XML as a directory-enabling technology, but the recently released Version 1.0 spec-

ification for the Directory Services Markup Language (DSML) will be the biggest boon to cross-directory synchronization and integration since the Lightweight Directory Access Protocol (LDAP). In fact, DSML will be even bigger than LDAP because it's designed from the ground up to support directory synchronization.

Among the highlights of the year, directorywise, were the consolidation of the Directory-Enabled Network specifications with the Desktop Management Task Force's Common Information Model; the release of Novell's new version of Novell Directory Services — now called eDirectory — for multiple platforms; Microsoft's purchase of Zoomit for its cross-directory synchronization expertise; the beginning of a new application category — possibly the killer

application for directories — called eProvisionware; and the emergence of third-party directory-management vendors (Fastlane, Mission Critical, Netvision and others) as the only real contenders for venture capital (and market capitalization) against the ubiquitous "e" businesses or ".coms."

What about next year?

New versions of so-called network operating systems from Microsoft (Windows 2000) and Novell (NetWare 5.1) will strike the death knell of LANs as they reach out to encompass a world of connected users. Directory services will take its rightful place as the plumbing that holds together the internet-worked world. Everything — from your computer to your toaster — will become directory-enabled. The wireless application protocol will bring network and server management to your

cell phone. Supply-chain management will finally become realistic with the use of XML, DSML and Microsoft's well-thought-out BizTalk initiative.

In other news, the Internet Corporation for Assigned Names and Numbers will continue to be a source of controversy and will become largely ignored as people devise ways to get things done quickly and efficiently. And Judge Jackson will determine that Microsoft should be broken into at least two parts — operating systems and applications. This will lead to Wall Street becoming disenchanted with high tech, bursting the .com bubble.

Happy New Year!

*Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at [wired@vquill.com](mailto:wired@vquill.com).*

The companies who put information to work in new ways are the ones who will succeed time after time. If you're driven to be among them, it's essential to have the right communications provider — one who has an intelligent network architecture, high-speed capabilities, and leading-edge technology solutions. And if your provider also shares your vision and has the ability to take you as far as you want to go, nobody can beat you.

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# Carriers & ISPs

The Internet, Extranets, Interexchange  
and Local Carriers, Wireless, Regulatory Affairs

## Briefs

**SBC Communications** is introducing a service to give customers warning when their frame relay service is having trouble. For \$75 per month, customers can get the FasTrak View Fault Management Service that notifies them by e-mail or pager when the network is having link and virtual circuit problems. Data comes directly from SBC switches and FasTrak keeps customer fault histories for six months.

SBC: [www.sbc.com](http://www.sbc.com)

**Williams Communications** is shifting from circuit-switched access to its voice network to **Sonus** packet-based access switches. In addition to replacing more costly circuit switches, the Sonus gear supports standard applications interfaces that enable independent software vendors to write programs to support new services such as network-based call management, IP fax and unified messaging. The less expensive Sonus switches mean lower rates for customers of the Williams network.

Williams: [www.williams.com](http://www.williams.com)

**BT Tel**, a **British Telecom** subsidiary in Spain, has launched its IP voice network based primarily on **Nortel Networks** gear. The network switches telephone calls without traditional circuit switched technology. BT Tel has deployed Nortel's ICE Call Server, a Java-based calling system; CVX 1800 Multiservice Access devices, used to terminate modem calls; and Nortel's Universal Signaling Point, which translates SS7 call signaling for an IP network. Last year BT Tel acquired a license to offer voice services in Spain, where it was previously only offering data services. Domestic carriers **AT&T** and **SBC** have been testing Nortel's Succession IP telephony products.

## UUNET expands managed VPN services

BY DENISE PAPPALARDO

**FAIRFAX, VA.** — UUNET is offering businesses more options for keeping corporate networks secure with new dial-up and global support for UUsecure, a managed virtual private network service.

UUsecure VPN dial edition is a fully managed service that lets customers link remote workers to a corporate VPN using security specifications such as IP Security and Layer 2 Tunneling Protocol. UUNET is supporting the service using Nortel Networks' Contivity servers at customers' premises. Remote users connect to the devices before being linked to their corporate VPNs. Users have Nortel's software client installed on their PCs or laptops.

The UUsecure VPN dial edition service includes a dedicated connection to the Internet that's used to aggregate all dial-up traffic. The Nortel Contivity device connects these dial-up users to their corporate VPN from the dedicated connection.

There is one significant drawback. If your company already subscribes to UUNET's UUsecure VPN dedicated edition service, you will have two separate VPN devices at the edge of your network.

The dedicated service only uses Xedia's AccessPoint QVPN routers, says Skip Taylor, a UUNET marketing director. While UU-

### What users want from their VPN

Managed VPN services can vary greatly. Here are some of the most important VPN features, according to more than 500 *Network World* readers.

Performance 77%

Security 72%

Ease of use 62%

Vendor experience 52%

Price 50%

SOURCE: TELECHOICE/NETWORK WORLD

NET manages both services for customers, the combined service may seem cumbersome and be more costly, experts say.

"Most users that are building their own VPNs or are teaming with an ISP are looking for a single vendor to address both dial-up and dedicated requirements," says Jim Slaby, senior analyst at Giga Information Group, in Cambridge, Mass.

UUNET's goal is to offer business users a UUsecure VPN Total Access edition service that will support dial-up and dedi-

cated users. Taylor says that service will be available by the end of March 2000.

UUsecure dedicated edition is available in Denmark, France, Germany, Hong Kong, Italy, Japan, Spain, Sweden, Switzerland and the United Kingdom. UUNET is slated to bring Canada and the Netherlands online in the next few months. "International support is significant, especially . . . where [prices for] dedicated private lines are still sky-high," Slaby says.

UUNET has also expanded its VPN alliance partnership. The ISP has tested VPN devices from Altiga Networks, Indus River, Newbridge Networks, V-One and VPNet and certified them for use on UUNET's network.

UUsecure VPN dial edition starts at \$950 per month, plus \$19.50 per month per user for 150 hours of Net access. Customers also pay a dedicated line charge. UUsecure VPN dedicated edition costs \$595 per month per 56K bit/sec connection, \$1,895 per month per 1.544M bit/sec T-1 connection and \$35,000 per month per 45M bit/sec connection. At its lowest cost, combined dedicated and dial-up support is more than \$2,000 per month for 56K bit/sec worth of dedicated bandwidth.

UUNET: [www.uu.net](http://www.uu.net)

## Bell Atlantic, GTE try to resolve merger conflict

BY DAVID ROHDE

**WASHINGTON, D.C.** — Still seeking merger approval from the government, Bell Atlantic and GTE have floated some ideas to resolve the biggest legal hurdle in their way: GTE has long-distance authority, and Bell Atlantic does not.

The companies last month filed two documents with the Federal Communications Commission listing three methods to resolve the conflict. But each of the methods could hamper network integration efforts designed to present a unified front to users — a frequent problem in telecom mergers — because they involve separating GTE's prized Internet transport division from the rest of the company.

In the first method, Bell Atlantic would place GTE Internetworking and other GTE long-distance operations in a trust, much as government economic officials themselves temporarily give their stocks

to an independent trustee to control until they leave office. The merged company would get GTE Internetworking back under its direct control after it had won long-distance authority for all the states in Bell Atlantic's region.

In the second idea, the merged company would actually sell GTE Internetworking to another party but would retain a right to repurchase the Internet division if it won long-distance authority for the Bell Atlantic states within five years. The third idea involves the merged company setting aside GTE Internetworking as a tracking stock, much as Sprint has done and AT&T is planning to do with their wireless units.

Alan Pearce, a former FCC chief economist, gives the sale-with-contingent-repurchase idea the best shot because it gets GTE Internetworking out of the merged company's ownership for a period of time. Pearce, president of Information Age Econ-

omics, a consulting firm in Washington, D.C., says the FCC has been adamant that no regional Bell operating company or its successor can own any long-distance transport until it receives long-distance authority. FCC approval of a trust for an RBOC would be "extremely unusual," he says. ■

[www.nwfusion.com](http://www.nwfusion.com)

### BEHIND THE MERGER

Filing: Read Bell Atlantic's application to the FCC for long-distance.

Fact sheet: Find out about the combined assets of GTE and Bell Atlantic.







Wan Monitor . Daniel Briere and Christine Heckart

## GUARDING AGAINST THOSE POST-Y2K HANGOVERS

**W**e're not going to bore you with another long-winded column on preparing for Y2K.

But what about the organizations that

have been overindulging in Y2K preparedness, so to speak, and are going to face hangovers? Just like the ones at the party who want to have fun now and

worry about the future later, they will soon wake up with one giant technological headache.

While they've spent the last year

focused on The Problem, some very important technology shifts have been emerging. IT managers need to take time now to re-evaluate emerging technologies to avoid aches and pains as they go into the new year.

With the drumbeat of digital subscriber line service announcements from competitive local exchange carriers, incumbent local exchange carriers, ISPs and others, the idea of consolidating DSL access costs makes a lot of sense.

Pop quiz: How many different DSL service providers are you buying from today? You might be surprised to find out exactly how many providers you are paying monthly and stunned at what you are paying. With some effort, you can reduce the number of DSL providers you pay down to two or three and save money through volume pricing deals.

As accepted as cellular phone usage has become in 1999, does your IT group have a cellular plan for 2000? The decisions made a year ago may not be the same decisions you would make today. Much like DSL access, cellular phone services have undergone changes that bode well for telecom professionals watching their budgets.

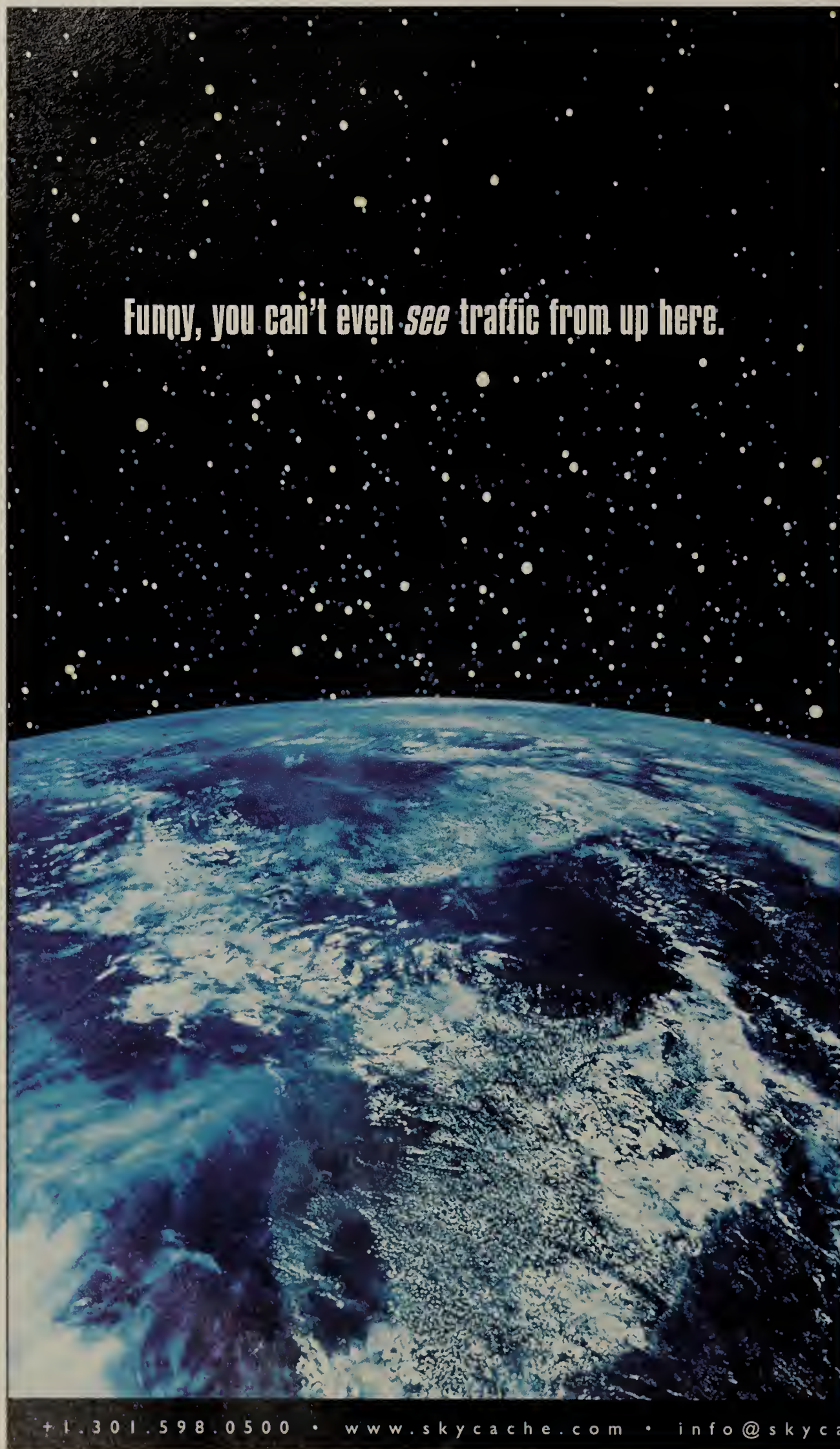
Most cellular carriers have spent millions of dollars expanding their service coverage areas and developing service plans that benefit business users. Several cellular service providers offer packages that include increased bundles of local and long-distance minutes and nationwide service coverage. Consolidating your cell phone usage onto one carrier could save big dollars.

While the fax-over-IP market has been slow to develop, free fax services delivered via the 'Net and e-mail continue to grow. Free faxing services from firms such as eFax and JFax offer a wonderful way for remote or traveling employees to receive faxes via e-mail. Faxes via e-mail give traveling employees a much more cost-effective way to stay in touch with the office, customers and suppliers.


Many of these services offer ways to send faxes via e-mail, providing even more savings. Consider one of these e-mail-to-fax services and promote it. You can look to reduce your overall telecom costs and head off having to support multiple free fax services.

These are just a few of our prescriptions that might help your organization deal with the headaches that are bound to materialize after all of this Y2K business is behind us. Should you have any tips of your own that you would like to share, please send them our way.

*Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at [dbriere@telechoice.com](mailto:dbriere@telechoice.com) and [heckart@telechoice.com](mailto:heckart@telechoice.com).*



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# Enterprise Applications

Intranets, Messaging/Groupware, E-commerce, Security, Network Management, Directories



## Briefs

**Shym Technologies** has released software, dubbed PKEable, for developers that want to add digital certificates to existing SAP R/3 applications. The PKEable tool kit, which is priced starting at \$17,500, supports certificates from Entrust, VeriSign, CyberTrust, Baltimore and Xcert International.

Shym: [www.shym.com](http://www.shym.com)

**Xcert International** in February will ship Sentry 4.0, software for creating a certificate authority that can support up to one million users of digital certificates from Entrust, Baltimore and VeriSign.

The current version of Sentry supports up to about 250,000 users. Financial firm T. Rowe Price Associates says it intends to use the Xcert public-key infrastructure software to secure e-commerce transactions with business partners and customers.

Xcert: [www.xcert.com](http://www.xcert.com)

**Viador** last week announced that it is moving into the business-to-business portal market with new product and service offerings. The new E-Portal is built on top of Viador's existing portal offering but adds a module for enhanced security, including user authentication and encryption.

The portal is designed to let companies share corporate information more easily via the Web. For its business-to-business offering, Viador has changed its pricing models to include concurrent users, business entities, unlimited usage and subscriptions.

Also last week, Viador announced a new service offering designed to help customers get a portal up and running within six weeks.

Viador: [www.viador.com](http://www.viador.com)

## E-comm vendors round out their offerings

*HAHT, Xuma add automated marketing, customer service features.*

BY CAROLYN DUFFY  
MARSAN

As e-commerce becomes more than online catalogs and credit card processing, makers of sales-oriented software and services are expanding their product lines to include e-mail marketing and customer service capabilities. The latest vendors to follow this trend are HAHT Software of Raleigh, N.C., and Xuma of San Francisco, which both recently announced new offerings.

Although the companies are in different segments — HAHT is a software vendor and Xuma is an application service provider — they've both added features such as e-mail campaigns, personalization and ongoing customer communications. Officials at the two companies say they're responding to demands from corporate customers to provide all-in-one e-commerce offerings.

"Your typical chief information officer is not going to want to do everything himself," says Rowland Archer, HAHT's president and CEO. That's why HAHT is offering turnkey e-commerce applications rather than development tools, he says.

Enterprise customers also want their e-commerce systems up and running in less than 90 days, says Jamie Lerner, chief technology officer at Xuma. "By using a lot of pre-existing components, we can rapidly assemble the site and hand it off," he says.

Xuma and HAHT aren't the only ones trying to provide one-stop shopping for e-commerce systems. Other vendors that are building comprehensive product suites either directly or through alliances include Ironside Technologies in Pleasanton, Calif., and InterWorld in New York.

### E-comm explosion

**Analysts predict the market for e-commerce software and solutions will rise sharply over the next four years.**

**E-commerce software and services market size and projections:**

**Market segments  
(In millions)**

**Sales and marketing:**

1999	\$675
2003	\$2,100

**Procurement:**

1999	\$851
2003	\$8,500

**Customer service:**

1999	\$60
2003	\$2,000

**Projected  
overall market**

**\$1.6 billion**

**1999**

**2003**

**\$13 billion**

SOURCE: IDC, FRAMINGHAM, MASS

### E-commerce

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## Directory start-up links e-comm apps, back-end data

*Radiant Logic's virtual directory combines LDAP, SQL and XML technologies.*

BY JOHN FONTANA

**NOVATO, CALIF** — At their core, directories are no more than network plumbing. The really exciting stuff happens when applications are built upon that plumbing.

Start-up Radiant Logic last week attempted to tap into that excitement by launching a "virtual" directory dubbed RadiantOne. The product is middleware that allows clients or applications to query SQL databases using only the Lightweight Directory Access Protocol (LDAP).

The intent is to provide an efficient way for enterprises to use back-end legacy data in Web-based e-commerce applications without having to hard-code database access into those applications.

"This technology allows us to complete our concept of a metahub directory for customer information by offering views of data based on customer profiles," says Ken

Hoang, vice president of Inference, which develops e-commerce and customer relationship management software. Inference is offering RadiantOne as an add-on to its K-Commerce Sales application, which allows salespeople to pull together data regardless of its location.

RadiantOne is described as a virtual directory because it doesn't actually house any data. It stores addresses of database queries it calls information resource locators (IRL). IRLs are preconfigured queries that have been converted to LDAP objects. When those objects are triggered, the directory changes them back to SQL queries and fires them off to the appropriate database. The information is then returned to the user. The data can be formatted in any of three ways:

See **Directory**, page 28

### FINDING DIRECTION

Face-off: Which is better: virtual or meta directories? Find out what Isocor and Entevo had to say.

White paper: An LDAP roadmap.







'Net Insider . Scott Bradner

## CONVERGENCE FROM THE OTHER SIDE

**A**t some random network conference over the past year, I signed up to get one of the magazines designed for the traditional telephone companies. I've now started getting the publication and am surprised about the amount of familiar information in it.

*America's Network* bills itself as covering "technology for the public network since 1909." It is definitely a magazine for telephone carriers and their suppliers. It has articles about telephone carrier topics, such as reusing the old digital loop carrier cabinets, 100,000 of which are scattered around the landscape, and telephone billing systems.

But each of the issues I've received also has contained a number of Internet-related articles. For example, the Nov. 15 issue included articles on the IETF's Multi-protocol

Label Switching (MPLS) technology, alongside a research report on the future of wireless telephones.

MPLS is in the final stage of being approved by the IETF as a proposed standard. The technology's origins lie in Cisco's Tag Switching, and MPLS was initially targeted at giving ISPs the ability to do traffic engineering. This ability involves directing IP traffic through paths in the ISP backbone that normal IP routing would not have chosen. For example, ISP traffic from Boston to San Francisco might normally be routed through Chicago. If the ISP links through Chicago get overloaded and the ISP has excess capacity in a fiber link through Cincinnati, the service provider can use MPLS to direct the Boston-to-San Francisco traffic through the Cincinnati link.

This function is just what some

ISPs with underlying ATM networks have been doing via ATM virtual circuits. MPLS allows non-ATM-based ISPs to do traffic engineering.

Later it became clear that this same traffic engineering could be used to help provide better-quality IP service for specific applications. Determining what MPLS path to use was based on what application was being run, rather than what city the traffic was coming from.

Most ISPs in the U.S. are focusing on the use of MPLS for non-QoS traffic engineering.

The articles in *America's Network*, on the other hand, focus on the QoS aspects. The same technology is being looked at from a different vantage point. Most of the magazine's IP-related articles are from this different vantage point — telephone companies' vantage point. More and

more telephone representatives are participating in the IETF, so some of these other views are now being incorporated into IETF work. But at times this can be a very different viewpoint indeed because the architectural and management assumptions that underlie the phone networks and the Internet are so very different. It will be interesting to see if we can keep true to the Internet model while learning from the phone input.

Disclaimer: Harvard has made a science of having different management assumptions for each of its schools, but the above observation is mine.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.*

### E-commerce, continued from page 27

Framingham, Mass. "A lot of users want to go to a single vendor to get their end-to-end e-commerce solutions."

Companies such as Xuma and HAHT are responding to two conflicting needs from enterprise customers: They want to build sites quickly, but they also want a great deal of functionality. "Customer demand is changing quite a bit," Pang says. "In the past, companies were satisfied with simple tools that allowed them to establish an online presence. Now they're looking for a lot more. They want richer solutions that allow them to support customers via multiple channels. And that's going to require a great deal of integration."

HAHT, a 4-year-old venture-funded company with more than 500 customers, has unveiled HAHT Commerce e-Scenarios, applications for business-to-business e-commerce that provide real-time integration with back-end systems from SAP, J.D. Edwards and PeopleSoft.

• The HAHT Shop e-Scenario, provides an online catalog, order entry, shopping baskets and credit card processing. Pricing for this module starts at

\$85,000. It is available now.

• HAHT Track, also available now, provides order status, shipment tracking and return status. Pricing starts at \$50,000.

• HAHT Market, which supports personalization, individualized e-mail campaigns and traffic analysis, will be available in January. Pricing for this module starts at \$150,000.

• HAHT Service, available in the first half of 2000, provides post-sales services, including order modifications, warranty renewals and account status. Pricing starts at \$150,000.

The applications run on HAHT's application server and development environment, which supports Unix and Windows NT.

The breadth of HAHT's product line helped attract Sigma-Aldrich, a St. Louis-based manufacturer of chemicals for corporate and university laboratories. With HAHT's software, Sigma-Aldrich was able to integrate its e-commerce site with legacy SAP and Lotus Domino systems.

"What we're doing now is order entry, pricing and availability, and order status," says Brian Lawrence, application development supervisor at Sigma-Aldrich. "The marketing module comes next. We want to add e-mail campaign management, personalization for cus-

tomers and the ability to cross-sell products."

Separately, 2-year-old Xuma is applying a "build-to-order" strategy to create e-commerce sites using preassembled compo-

**■ "[Users]  
want richer  
solutions  
that allow  
them to  
support  
customers  
via multiple  
channels."**

Albert Pang, e-commerce analyst, IDC

nents to handle common functions such as credit card processing, tax calculations and check processing. Many of the standard components are housed on equipment at Xuma.

"We just rolled out gift certificate processing," Lerner says. "Our customers didn't have to buy hardware or software. They can link to that functionality."

Setting up an e-commerce

site through Xuma costs between \$300,000 and \$1 million, company officials say. While customers own their e-commerce applications and data, Xuma provides hosting and maintenance services for an additional fee. Company officials say they have delivered 70 e-commerce systems.

One Xuma customer is Maxim Integrated Products, a Sunnyvale, Calif.-based semiconductor manufacturer that is launching a new e-commerce site in two weeks. Designed by Xuma, the new site will provide Maxim with a direct channel to a larger number of customers.

"Our current site handles credit card processing only. The new site allows us to set up purchasing terms. It's oriented for business-to-business purchasing," explains Ken Huening, vice president of MIS at Maxim. "Users can get quotes for large volumes. . . . They can look up back orders and shipping status. [The new site] will provide efficiencies for our customers that they haven't had before."

Xuma will host Maxim's e-commerce site, and Huening is already looking to the company to help add new functionality such as live chat.

HAHT: [www.haht.com](http://www.haht.com);  
Xuma: [www.xuma.com](http://www.xuma.com)

### Directory, continued from page 27

LDAP, XML or SQL.

While IRLs remain static, retrieval of back-end data is done in real time, reflecting the most up-to-date database information. IRLs are universally available, and using directory-based authentication and access controls, custom blocks of IRLs can be created for each user.

"RadiantOne has gone beyond the standard database connector to create a relationship between records stored in a directory and the rows and columns of database information," says Larry Gauthier, an analyst with The Burton Group. "They are using the directory as a border between internal systems and the external exposure of data. They have really combined the best aspects of LDAP, XML and SQL."

RadiantOne includes a ViewDesigner, a point-and-click interface to create IRLs.

RadiantOne runs on Windows NT and will include plug-ins for Active Directory, Netscape's iPlanet and IBM's SecureWay products. The software, which ships next month, is priced at \$50,000 for the first server.

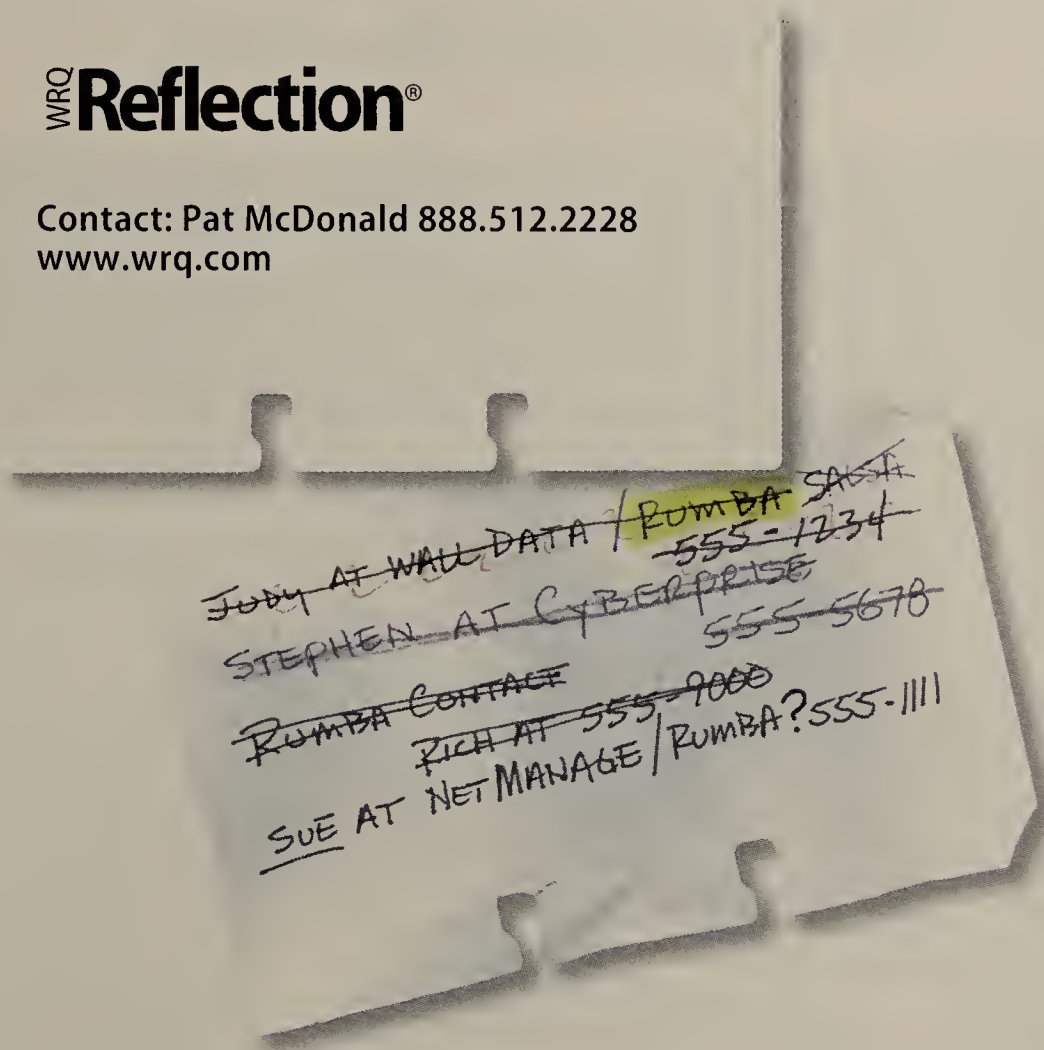
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# Open source software gets a safety net

BY APRIL JACOBS

Open source software has taken up residence on enterprise networks despite initial concerns that its unconventional version control and support structure would make it a risky bet for corporate IS.

One big reason that companies have moved from playing around with open source programs, such as Linux, to using them in production networks is that a greatly improved service and support network has emerged.

Whereas at first companies relied solely on an informal network of online developers to get answers to their open source questions, service and support is now available from many sources. These include commercial Linux vendors such as Red Hat Software and Caldera Systems, as well as hardware companies such as Dell and IBM that install Linux on their computers. Also gaining attention are companies, such as Linuxcare and Mission Critical Linux that specialize in supporting open source software, as well as smaller consultancies.

"Certification, support and training opportunities are just exploding out there, and that is definitely contributing to some of the success open source is having," says Michael Prince, chief information officer at Burlington Coat Factory Warehouse in Burlington, N.J., which is installing Linux desktops at all 280 of its stores.

Companies offering Linux service and support are pitching everything from technical support and training to hardware and software integration.

Linuxcare, for example, offers all those services, plus device driver development and consulting. Others, such as VA Linux, which had a whopper of an initial public offering two weeks ago, are trying to minimize the need for additional service and support by offering turnkey hardware and Linux software systems that are easy to pop into enterprise networks.

## A lot of activity

Linux support companies have been forging partnerships and releasing new services at a furious pace, and Linuxcare has been among the busiest.

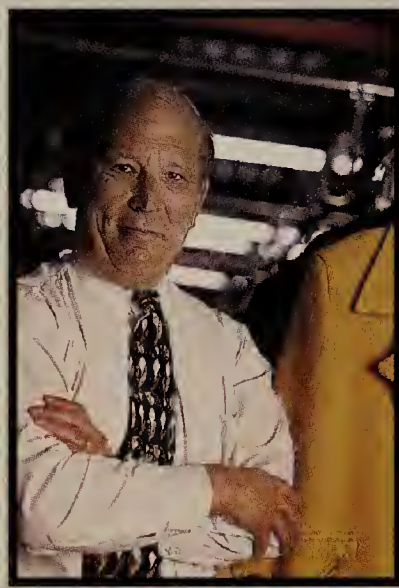
Just last week, for example, Linuxcare announced three acquisitions (Prosa, The Puffin Group and Check Consulting) designed to expand its service and support capabilities. The company also aired plans to open nine global service centers to expand its services for customers who use Linux worldwide. The service centers will focus on parallel computing and clustering, application porting, and custom versions of Linux and Linux applications.

Meanwhile Linuxcare unveiled an agreement with

## SERVICE AND SUPPORT

***New support offerings make Linux a safer enterprise network bet.***

Informix to offer technical support to Informix employees and customers. Linuxcare, which last week announced it has received an additional \$32.5 million in a second round of venture funding, already has contracts in place with companies such as IBM to deliver support to enterprise open source software customers.



***"We've been committed to Linux for almost a year now, and we knew firms like Red Hat would eventually evolve into a more formal business model [offering full-blown service and support]."***

Michael Prince, chief information officer, Burlington Coat Factory Warehouse

Also last week, a company called Mission Critical Linux introduced a service dubbed Secure Service Technology, which alerts Mission Critical via the 'Net when customers' open source systems are acting up. Mission Critical of Lowell, Mass., can then access the systems to monitor the situation and diagnose problems.

Established hardware vendors such as Dell, Compaq and Sun have also been busy showing their support for Linux, Apache and other open source technologies by bundling the software with their hardware. By doing so, these hardware companies are taking some of the challenges out of deploying the software.

Two weeks ago, for instance, Dell announced it would begin factory-installing Red Hat Linux on its servers to exact customer specifications. The No. 2 server maker already offered the operating system on all of its workstations.

These companies aren't oblivious to market research reports that show Apache being used for half of the Web servers in existence and commercial Linux being the fastest-growing server operating system around.

Burlington Coat Factory's Prince says he never had a doubt that service and support would be available for enterprise Linux installations. His company went with Linux over Solaris, which he says was overkill for his applications, and over Windows NT, which he says couldn't match Linux's stability.

"We found Linux to be very stable, and at a technical level we have found answers very easy to come by," he notes. "If we do need help, there are firms that will gladly provide us with support."

Not only are product and support organizations offering basic technical assistance for open source software, but they also are adding more sophisticated services to their repertoires, such as developing device drivers for Linux systems.

Chris Hawk, president of Solid State Design in Denver, says he chose Hewlett-Packard servers running Linux because HP had already gone to the trouble of writing the device drivers he needed to get the servers up and running right away.

Hawk says he has also found that support for Linux is becoming more commonplace on the applications side of the equation, as well. He points to Oracle's announcement that it would have a Linux version of its database software as a good example.

"I was more inclined to go with a Linux database when Oracle announced that they offer a Linux version of their software," he says, noting that support from established vendors is important in the business community in building confidence in any hardware or software platform. "If you are running a business, it means more if you can say, 'We run Oracle,' than something no one has heard of before."

Other users are glad to see commercial entities focusing on open source service and support, but are just as happy to support their own open source installations given that they have access to the source code.

"We have the keys to the city," says Brian Stroh, vice president of information services at Nettare.com, an online services provider that uses Apache for its Web servers.

Stroh says companies without the technical expertise should turn to third-party providers for support, but for those with good technical resources, he notes that the technical documentation for open source applications is often more comprehensive than what is available for commercial applications. "Apache documentation is well done and gives us the ability to customize it ourselves, rather than deal with a typical support site and pay for it," he says.

*James Niccolai, a correspondent with the IDG News Service, contributed to this report.*





# Technology Update

An Inside Look at the Technologies  
and Standards Shaping Your Network

## Optical access networking pays off

BY JEFF GWYNNE

Half of corporate users intend to double their bandwidth over the next two years, according to Forrester Research. So where will this bandwidth come from? Enterprise customers have limited options today: bandwidth-constrained T-1 lines or costly and hardly ubiquitous T-3 lines.

Fiber is the answer. While only 3% of businesses today are connected to fiber, 76% are within one mile of it, according to Vertical Systems Group. Until now, however, the only way to connect fiber directly to businesses was to use expensive

mises; and a PON between the two. Besides the fiber, the only outside requirements in a PON environment are low-cost (hundreds of dollars) passive optical splitters and couplers that split or combine traffic in much the same manner as a T-connector on a garden hose — half the light goes one way, half the other. The couplers/splitters are commodity items that can be bought from a host of leading optical component manufacturers.

An OAS is an IP/ATM switch capable of aggregating the traffic from hundreds of IOTs located “downstream” across the PON. Equipped with standard interfaces, the OAS provides an efficient entry point

able to segment a wavelength into smaller pieces, or slices. Just as dense wave division multiplexing augments the amount of wavelength supported on a fiber, the ability to slice wavelengths increases the amount of endpoints that can be served by a single wavelength. With this accomplished, service providers don't need to make the astronomical investment associated with delivering a wavelength to every customer.

Another key attribute of OAN is taking advantage of the embedded fiber infrastructure. By using passive optical splitters and couplers in the outside plant, service providers just need a small amount

### Ask Dr. Intranet

By Steve  
Blass

We would like  
to share files in  
our intranet from a  
Sun Solaris 7  
server to a few  
Macs. Is there a  
product that acts

like the Samba open source  
software and lets Macs see the  
files on Solaris? Freeware or  
shareware is preferred.

Via the Internet

You can share Unix files with Mac users in a couple of ways. If you're using Apple's MacOS X Server, you can use Network File System (NFS) to communicate with the Solaris 7 server without using third-party products.

Otherwise, several packages, such as netatalk, are worth examining. Netatalk, which can be found at [www.mtusradm.mtu.edu/mtudocs/netatalk](http://www.mtusradm.mtu.edu/mtudocs/netatalk), will let your Unix server communicate with Macs via AppleTalk.

Another implementation of AppleTalk for Unix is the Columbia AppleTalk Package (CAP), which provides an AppleShare 2.1-compatible server, a LaserWriter Spooler and a program to print to LaserWriters (papif). CAP is available for free at [www.smu.oz.au/appletalk/cap.html](http://www.smu.oz.au/appletalk/cap.html), but you will need to patch, compile and install it.

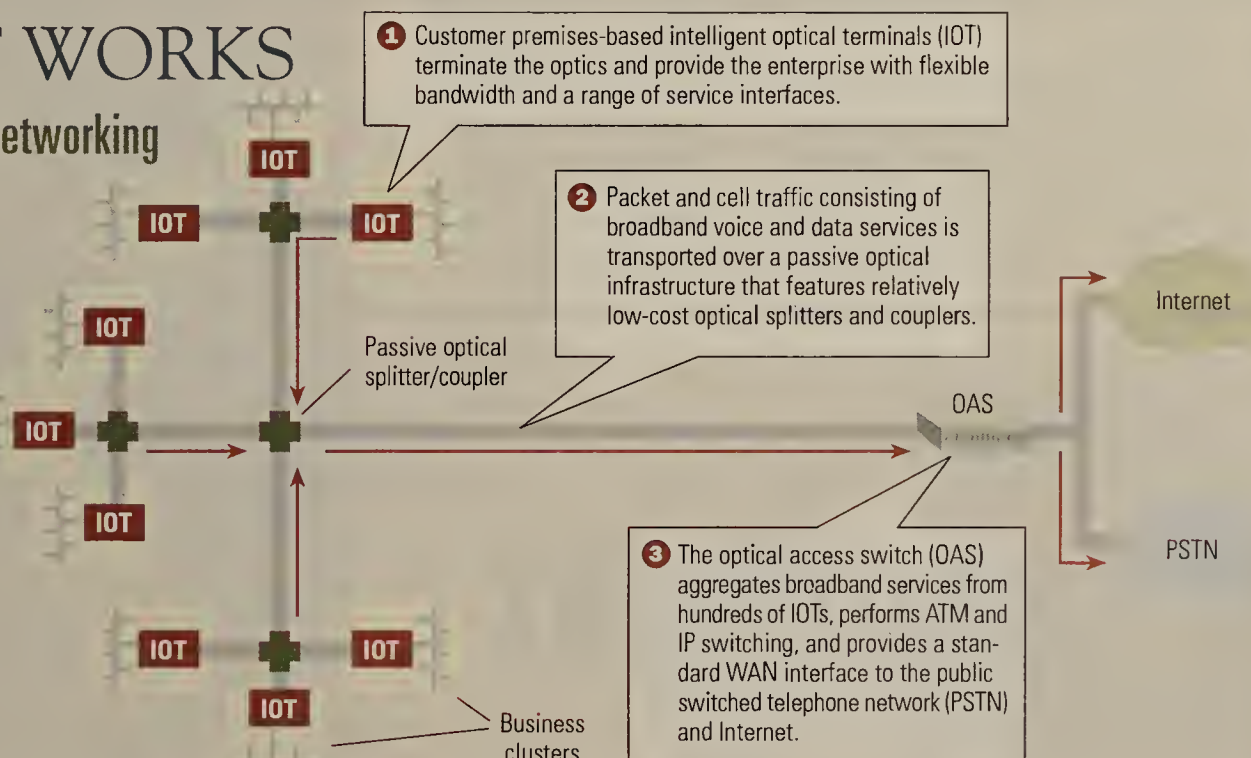
Another option if you are running Samba on your Solaris server is Thursby Systems' Dave product. Dave runs on your Mac and lets you see SMB/CIFS (Windows) shares from the Chooser. In this arrangement, your Mac sees the Unix files as Windows shares. Thursby has also recently released an NFS client for MacOS.

Blass is a network architect at Sprint Paranet in Houston. You can reach him at [dr.intranet@paranet.com](mailto:dr.intranet@paranet.com).

### HOW IT WORKS

#### Passive optical networking

Based on PON principles, optical access networking lets service providers better utilize the embedded base of fiber, while giving clusters of business customers broadband voice and data services with flexible bandwidth from 1M to 100M bit/sec to dedicated wavelengths.



SONET equipment that did not justify the connection of fiber to every building.

Optical access networking (OAN), an emerging network technology, is a viable alternative for eliminating the bandwidth bottlenecks that lie between the ever-expanding capacities in LANs and WANs. OAN lets service providers deliver fiber-based broadband services to businesses of all sizes. Based on the principles of a passive optical network (PON), OAN does not require costly active electronics in the outside plant, thereby enabling service providers to cost-effectively provision businesses with the bandwidth services they need.

An OAN consists of three components: an optical access switch (OAS) in a service provider central office; an intelligent optical terminal (IOT) at the customer pre-

into the WAN. The pizza-box-size IOT is a low-cost piece of customer premises equipment that supports broadband voice and data services.

In access networks, one size does not fit all, and that's just what is available today with T-1s, T-3s and digital subscriber line. OAN enables business customers to receive lots of flexible bandwidth, ranging from 1M to 100M bit/sec to dedicated wavelength. What's more, OAN enables customers to rapidly change the amount of bandwidth they are receiving to support fluctuations in their bandwidth needs, such as a retailer changing its service level from 3M to 10M bit/sec during the holiday season.

Because few firms are ready for an entire wavelength's worth of service, it is critical for an OAN implementation to be

of fiber in the vicinity of an office park, which can then be fanned out to serve multiple business customers.

The delivery of a high-capacity broadband fiber infrastructure will finally remove the last-mile barrier in the public network. Much like the proverbial chicken-or-egg scenario, armed with unfettered access to the Internet, business customers will finally take advantage of the promise of next-generation services, such as virtual private networks, business-to-business e-commerce and application outsourcing.

Gwynne is a founder and vice president of marketing of Quantum Bridge Communications in North Andover, Mass. He can be reached at [gwynne@quantumbridge.com](mailto:gwynne@quantumbridge.com).



**Gearhead** — inside the network machine . Mark Gibbs

## SIMPLE QUESTION, COMPLEX WEB

**N**ever make anything simple and efficient when it can be complex and wonderful — this from a lapel badge seen at an engineering conference.

A Gearhead reader asked a simple question: "How does a Web server application get the data from a form?"

As with all apparently simple questions, the answer is anything but, and it leads us down a twisty maze of technology. Cool.

Perhaps we should start at the lowest level: the HyperText Transfer Protocol. HTTP is a simple protocol that is transported over a TCP connection, as opposed to User Datagram Protocol (UDP). Using TCP ensures data delivery, whereas UDP does not.

A typical HTTP transaction goes like this: A client opens a connection to the HTTP server's port (the default is port 80), sends a request, the server responds, and the client closes the connection.

HTTP is described as a "connectionless" protocol, which means each exchange between a client (browser) and a server stands alone — no state information within the protocol connects one request to another. The con-



sequence of this is that to keep track of a user between separate requests requires some fancy footwork outside of the protocol, hence cookies and other state maintaining techniques.

There are several versions of HTTP. The most common is HTTP/1.0, but the latest version, HTTP/1.1, is spreading fast.

When an HTTP request is made, it (like all other mainstream TCP/IP protocols) consists of a sequence of text commands. For example, the most common HTTP request is GET. A GET request looks like:

```
GET/stuff/mydoc.html HTTP/1.0
User-Agent: xxxxxx
Accept: image/gif, image/jpeg, */*
```

This HTTP/1.0 request is asking the Web server for the document

"mydoc.html" in the subdirectory "stuff." The next line specifies what the browser is or at least what the browser wishes to identify itself as.

Needless to say, you can't trust this data, and many utilities such as Blue Squirrel's Web Whacker, a tool for copying Web sites, let you specify what kind of browser you tell the server you're using.

The Accept header defines the Multipurpose Internet Mail Extensions data types the client can understand, and \*/\* just says the equivalent of "lay it on me, I can handle it."

If the browser's request can be fulfilled (that is, the document requested exists and is available), the server will respond with something like the following:

```
HTTP/1.0 200 OK
Date: Mon, 13 Dec 1999 13:20:23 GMT
Server: xxxxxxxx
Last modified: Mon, 19 May 1998 01:04:03 GMT
Content-Length: 1002
Content-Type: text/html
```

Following this header is a blank line and then the actual content. The end of the content is usually signified by

the server closing the connection. The browser can also close the connection when it has received the expected number of bytes.

Most of this is pretty obvious (the server's identification would appear in the place of the x's). The content is 1,002 bytes long and is an HTML document (the type is actually "text," of which "html" is a subtype).

The first line of the header is important, as it contains the status code — in this case "200," which means success. All 2XX codes indicate life is good, while 3XX codes tell the browser to go to a different page, 4XX means the client has a malformed request or has requested something that can't be done. The most common 4XX error you see is 404, which means the content you've asked for doesn't exist.

5XX errors indicate a different type of problem — the request is valid but the server cannot fulfill it.

Well, here we are running out of space rapidly and we're still some way away from answering the simple thing we started out with. Next week we'll carry on with complex and wonderful.

Send the story to [gb@gibbs.com](mailto:gb@gibbs.com).

## Network World Fusion Spotlight

News, tips and tools from our Web site

### In the Works

What if you could harness the power of several hundred computers to develop or run high-powered applications at the desktop? In this week's "In the Works" column, Argonne executives Tim Kuhfuss and Rick Stevens tell you about a project on tap at their research facility that will let you do just that. The Grid, they say, can be likened to the electric power grid, which tells you what resources are available around the country. They also

say the rollout of this distributed computing project will let ordinary users access high-end applications. With this access, they'll be able to include virtual reality demos in sales pitches, work with complex computing problems or run larger batch downloads. Let us know how you would use supercomputing power.

*DocFinder: 6028*

### Y2K coverage

What will you do if your systems go haywire around New

Year's Eve? Read our front page story and check out our online resources. Need information about the power grid? Check out the Department of Energy's Y2K site. Go online for companies' hotline information and Y2K contingency planning sites. We'll also have coverage of happenings around the globe throughout the holiday weekend. Make Network World Fusion your one-stop shop for Y2K info.

*DocFinder: 6029*

### Know thy user

Run a Web site? Don't just use logs to see how many page views you get, track what users are keying into query boxes. *Network World Online* Editor Adam Gaffin says monitoring what users are doing online can lead to interesting revelations. You'll get clues on how to enhance popular parts of your site, and you'll be able to see what features aren't working. Looking over your

findings also might give you hints on how to solve those issues. Gaffin will tell you how this approach helped Fusion improve a feature on the site.

*DocFinder: 6030*

### Counting on Exchange

A reader administers an Exchange server for about 600 users in his firm's enterprise. His supervisor asked if he could monitor how many users were connected to the server at any given time, and he wanted to know if there was a way to log the information. Help Desk Editor Ron Nutter says such monitoring and logging can be done. He suggests using Performance Monitor, which is included in the Administrative Tools (Common) menu on NT Server or Workstation. He has other tips for getting the job done.

*DocFinder: 6031*

### Extra: Extranets are in

Columnist Dan Blum says

extranets will find themselves under a harsh spotlight next year. "On Jan. 1, when the lights come on, the year of the extranet will begin," Blum says. "It's time to consider a New Year's resolution to build the next-generation infrastructure that will make your company an e-business player." With tons of money flowing into business-to-business e-commerce, he says it's time to make your extranet move. Have you already implemented one? Let us know.

*DocFinder: 6032*



Ron Nutter is standing by to answer your networking questions. Read his column every week on Fusion. *DocFinder: 2450*



WAN products  
and services  
keep changing.

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offices need  
better connectivity

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placing new  
demands on  
your network.

And your  
budget isn't  
growing as  
fast as your  
applications.

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**John Gallant**, **Editorial Director** of **Network World**,  
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vendor strategy presentations and roundtable  
discussions on today's critical areas of WAN  
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- *Managed Services and Equipment— What are they and why should you be interested in them?*
- *Access Services and Equipment — How can you maximize your access dollars?*
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## Editorial

### Our great Linux debate is ready for prime time

If you're considering Linux for your enterprise, I've got a holiday gift for you.

Last month, I challenged four leading Linux providers to take part in *Network World's* Linux Showdown at the Linux World Conference & Expo in New York in February.

Caldera, TurboLinux and SuSE all accepted and will be sending top executives to this special presidential-style debate. Caldera is sending CEO and President Ransom Love; TurboLinux is offering up John Terpstra, its point man on open source development initiatives; and SuSE is sending President Marc Torres.

Unfortunately, Red Hat — the most visible company in the Linux market — won't play. A spokesperson said: "We think this distribution vs. distribution showdown format is counter-productive to the Linux community and will result in the opposite result than the one the organizers are hoping for. Instead of clarifying anything, it will only serve to confuse."

Now I don't want to be too harsh on Red Hat, which is taking part in our NOS Showdown at ComNet in January and also participated in another *Network World* Showdown at NetWorld+Interop earlier in 1999. But I wholeheartedly disagree with the company's position, and most members of the Linux community that I interviewed also disagreed, feeling that debate among these companies will be valuable to current and prospective users. If you also disagree, let me know and I'll forward your comments to Red Hat. I'll make room for the company if your comments stir a change of heart.

After my first editorial, I heard from lots of readers, many of whom suggested that VA Linux should be represented on our debate panel, as well as someone to speak on behalf of Slackware and the FreeBSD distribution of Unix. VA Linux offered up CEO Larry Augustin. Larry, you're in. I also got an offer from Robert Bruce, president and CEO of Walnut Creek CDROM, which distributes FreeBSD and Slackware. Robert, you're on.

Our vendor executives will field questions from a panel of experts, including Nick Petreley, editorial director of *LinuxWorld* ([www.linuxworld.com](http://www.linuxworld.com)), and Bob Brown, our news editor. The executives will also ask each other unscripted questions and take questions from the audience.

Mark the time, date and place: 4:15 p.m. to 5:30 p.m., Feb. 2, at the Jacob Javits Convention Center. See you there. Oh, and Red Hat, please reconsider before it's too late.

— John Gallant  
[jgallant@nw.com](mailto:jgallant@nw.com)

Message Queue

### WOMEN IN IT

Some thoughts regarding your article "The critical shortage of women in IT" (Nov. 22, page 53):

Yes, we indeed do have a shortage of women not only in IT, but also in many other areas of the job market. Women add an important aspect to every layer of business with which they associate themselves. Men and women working together have always been able to complement one another for greater success. Women think differently than men, and therefore add a new and sometimes better line of thought to any project.

However, there is a terrible shortage of women in the home, as well. Your article does address this a bit. I believe that the poor work ethic of many young Americans and the change in today's society comes from the fact that Mom is often more actively concerned about her career than her family. Today many children are raised by someone else (day care and schools).

American business will be best served by raising a generation of people whose work ethic will again make America a truly productive nation.

Harold Winne  
Rockford, Ill.

### SAME SONG, DIFFERENT TUNE

Regarding your article "Vendor certification: Does anyone care?" (Nov. 29, page 21):

The certification "controversy" has moved from emotional to short-sighted. The stock answers of "paper Microsoft Certified Systems Engineer (MCSE)" and "experience vs. skills" are so overworked and whiny as to be trite. Yes, some who have the certification don't have the ability, and some who have the ability don't have the certification. Duh!

Certification is just a benchmark. Anyone looking to make certification a guarantee of income is misguided. Anyone hiring solely on the basis of a certification is similarly misguided.

Tangentially, if MCSEs and Certified Novell Engineers are not real indicators, why the fuss over changing the programs? If certification really doesn't

indicate ability or technical know-how, why be upset about the fact that the certifications no longer hold for older technologies? The article does a good job of pointing out that the two camps are just shouting the same song to a different tune, in a different meter, with a different chorus. This is not a clash; it is two completely different takes on what would seem to be the same issue.

Allen Clarkson  
San Antonio, Texas

### SOMETHING ABOUT CISCO

Regarding Kevin Tolly's column "There's something about Cisco" (Nov. 29, page 25):

About time someone beat up on Cisco for being average and not a product leader anymore. Cisco controls so much of the enterprise that no one can even think about making a decision not to use Cisco products without some reprisals.

We are seeing a repeat of the '80s, when IBM created fear, uncertainty and doubt. But IBM sure learned its lesson the hard way. Will Cisco? History has a way of repeating itself. Give the little guy a chance.

Tim Kraskey  
Founder and general partner  
Mentor Group  
Andover, Mass.

There is something about Cisco ... it's called the Internet. Granted, the Catalyst is slow compared to many switches available, especially in the Layer 3 arena, but the overpowering presence of Cisco in the realm of the Internet cannot be taken for granted.

There is something else about Cisco — in fact, it is the best thing Cisco has going for it. If there are technical issues to be resolved, Cisco will work with you to resolve them ... sometimes into the wee hours of the morning. I have yet to find a company that has a better service model than Cisco. I have been in some of the hairiest of network-down situations, and when I needed it, Cisco support came through.

Scott Keoseyan  
Senior network engineer  
BroadWing  
Reston, Va.

Send letters to [nwnews@nw.com](mailto:nwnews@nw.com) or John Dix, editor in chief, *Network World*, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

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## ASPs: RIGHT CONCEPT, BUT THERE'S A BETTER WAY

The application service provider market is currently a hot media darling. But while the ASP concept is a good one, the prevailing mode of execution and delivery is flawed. Users don't need someone to come in and assume control of their environments. In most cases, they don't need more boxes, faster switches or more sophisticated tools. What they need is a partner that will provide them with information that is specific, timely and actionable. This is where the network information service provider (NISP) comes in.

The NISP is a spinoff of the ASP prototype. Under the NISP approach, control remains with the user and critical applications are hosted right on the customer site. Users are provided with the specific information they need to run their networks — not a laundry list of disparate data points culled from stand-alone network tools and applications that have their own interfaces. If a problem occurs on the network, it is the user who fixes it — not the NISP.

The philosophy behind the NISP model — unlike its ASP cousin — is to go beyond simply delivering

an application by providing the core value associated with it. For example, a user could turn to an ASP to get a suite of network management tools in the form of five applications that are launched separately and viewed by different interfaces. The result will be five disparate streams of data. While the user has gained access to the needed applications, he must still analyze and correlate all the data on his own.

A NISP providing the same network management suite will integrate those five applications into a single solution and provide the user with a single interface where all the information from the tools is viewed and, more importantly, completely correlated. The result is a single information stream, which represents the biggest overall value a NISP brings to the table: turning data into actionable information. Instead of simply alerting users to the fact that a certain node is down, the NISP tells them the root cause of the problem, how it's affecting other aspects of the network and possible resolutions.

The NISP significantly reduces users' risk of implementation by removing the pain associated with de-

signing, testing and evaluating applications and tools as well as performing continuous upgrades, maintenance and troubleshooting. This frees up IT resources and allows users to spend more time dealing with core business issues.

The NISP will also offer value-add services through its back-end data center, including software distribution, collection of long-term trending data for each user and a comprehensive knowledge base. The knowledge base will establish industry benchmarks for vertical-specific IT environments that users can then use to evaluate the effectiveness of their own IT staffs and infrastructures.

Under the NISP model, users still run their own nets. They retain control, and their jobs are not at risk. They save money. They become more strategic. And most importantly, they gain a competitive advantage.

*Igoe is founder, president and CEO of SilverBack Technologies, a network information service provider in Billerica, Mass. He can be reached at (978) 670-9944 or jigo@silverbacktech.com.*

## Reality Check . Thomas Nolle

### IS THE INTERNET OUTGROWING SELF-REGULATION?

If you try to load an MP3 file from a source and the process doesn't work, you probably sigh and try again. If you try to complete an Internet transaction on your favorite retail site and you're left wondering whether you really bought something, you're probably seriously annoyed and might send the company an e-mail. If you try to call 911 and it doesn't work, you might be dead. Moral: Entertainment



is optional, but that which supports life and shopping is mandatory.

Ten years ago, the Internet was a network of academia that most people in the U.S. didn't know existed. Today, it's being promoted as a fundamental part of our

economy and society. We've elevated other technologies to this level before, notably voice telephony and television. Those technologies have more or less willingly submitted to regulation. The majority of the Internet community, however, seems to be insisting the Internet is above regulation.

Most, though not all, Americans are comfortable with the idea that Internet content can't be censored. We've dealt with uncomfortable issues such as pornography by providing content filtering at the client edge, accepting that some uncensored material may fall into children's hands. Everybody may not like this trade-off, but it's consistent with trade-offs we've made in our other public media. There's no real problem with Internet content — nothing that justifies fixing.

There is a problem elsewhere, though, because



some in the Internet community want to draw the shield against censorship across the boundary between the application and operation of the Internet. At a recent Internet Engineering Task Force (IETF) gathering, reported on by Scott Bradner, a majority indicated its unwillingness to support federal regulations on wiretapping and call tracing. The Internet community's attitude raises questions about its willingness to operate in the public interest.

We've recently declared Microsoft to be an evil empire, a monopoly. In essence, we fear the power of a few corporate bigwigs to dictate to the rest of us. We wouldn't accept Microsoft's assertion that it's above the law. How about the IETF, then, or the Internet community? Perhaps their arguments against regulation are more moralistic. But doesn't their "we know what's best for the rest of you" attitude sound just like Microsoft's arguments? Is the manipulation of the many by the few evil because it's done by a corporation or because it's done at all? Antitrust laws are laws, just like wiretapping and call tracing laws, and are just like the telecom regulations on universal service subsidies that the Internet community also doesn't want to pay.

Does this mean we should forcibly regulate the

Internet? Maybe not. As it happens, there may be a free-market solution to the problem, one that will create a balance between the goals of the Internet community and the goals of the society and economy the Internet benefits and receives benefits from.

What is the Internet? It's not a collection of routers or fiber links; it's a collection of Web pages and sites. The application of the Internet is above the technology. To secure access to

Microsoft's site, we use something we call the Internet, but that site is just a URL, and any technology that could connect our browser to the location that URL represents would support our individual needs. In fact, a hundred different public IP networks could be stacked like coins all over the world, with each network touching our major access points of presence. At these POPs, any set of criteria meaningful to the Internet user could be applied to decide on which of the "Internets" traffic was to be carried.

Facility-based carriers have long accepted the regulations necessary to establish societal control of what has become a crucial social resource — telephony. If the Internet community refuses to accept regulation, then the established carriers will simply stack a new set of Internet "coins" on the current structure, offer a responsive and responsible alternative to the Internet we know today, and let the public decide.

Think about it, IETF.

*Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.*



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BY BONNY GEORGIA

**S**treaming media, which has long been a popular feature of consumer-oriented Web sites, is now gaining popularity in corporate networks as an effective communications tool and an important way to save money.

Everything that makes streaming audio and video a powerful communications medium on the Web makes it a natural fit for the enterprise. Compared with static photos or plain text, streaming media has more impact on the end user, increasing the overall effectiveness of the message.

Broadcasting streaming media live to employee desktops is a great way to deliver timely messages. And making media streams available on demand means users can access information no matter where they are or what time zone they're in.

Anyone with a reasonably current PC equipped with video and sound cards, a browser and a playback utility can access the corporate intranet and view late-breaking news announcements, attend CEO briefings, participate in long-distance training seminars, or review other mission-critical information that would normally require travel or attendance at a large, location-specific meeting.

Outside an organization, streaming media is perfect for informing key partners, customers and the media of new product launches, holding sales force training events, conducting virtual trade shows and enhancing customer service.

Corporate customers are discovering that streaming media can result in huge reductions in marketing, training and traditional communications costs.

For example, Hewlett-Packard recently invested \$60,000 to implement streaming media based on Microsoft's Windows Media Technologies and Webcasting services from Network24 Communications. The goal was to reduce the need for multicity marketing road shows, audio conferences and video conferences related to product launches. The company reported savings of \$1.2 million in the first year alone.

Although concrete numbers on the current installed base or growth projections of streaming media in the enterprise are hard to come by, anecdotal evidence clearly shows Fortune 1000 firms, especially those with an existing competency or corporate culture built around video, are shifting to it for in-house use at a rapid rate.

## Eric in the morning

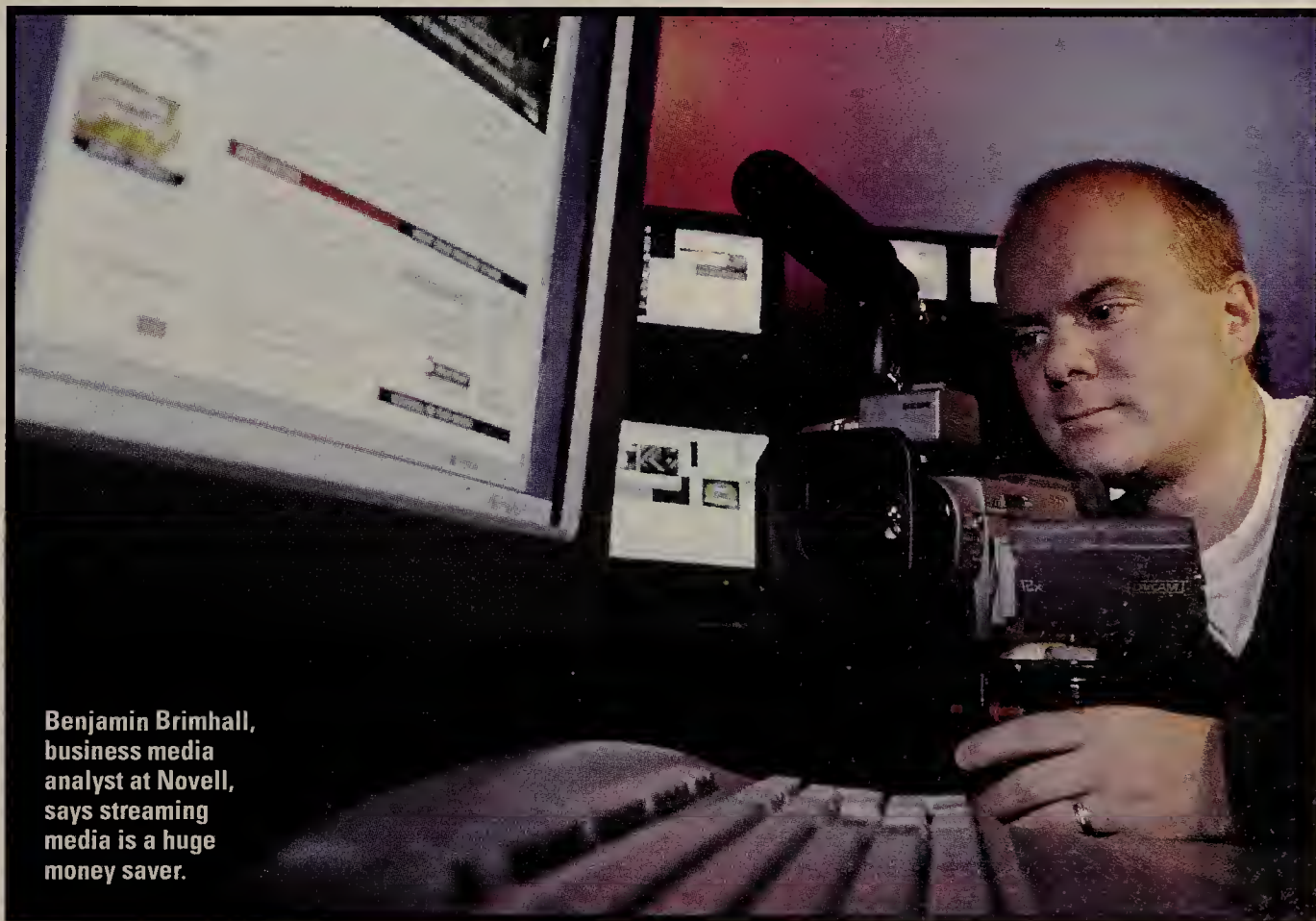
Novell was introduced to the power of streaming media about two years ago and has been expanding its use ever since. "The Web group wanted to do a video broadcast of a product launch, so we got the Real Networks tools, developed a streaming media event around it, and it went well," says Benjamin Brimhall, business media analyst at Novell.

The next major event to be Webcast was Novell CEO Eric Schmidt's address at Comdex. "We realized that beyond the 9,000 people at Comdex watching this thing live, we were able to extend this content to a significantly larger audience for very little cost. So we started to try it with more things," Brimhall says.

Today, Novell holds a number of streaming media events on a regular basis. For example, Schmidt

# STREAM ON!

**Streaming media is taking off at corporate sites.**



**Benjamin Brimhall, business media analyst at Novell, says streaming media is a huge money saver.**

records "radio shows" for employees once a month, and on a quarterly basis he comments on the company's financials. "These are delivered to everyone's desktops in the morning. They come in and see a new Eric Schmidt radio show is available, and they can listen to it and get a feel for what's happening around the company," Brimhall says.

Outside of the company, Novell uses streaming media for marketing, sales training, technical training, developer training, product information and to extend the reach of corporate events at trade shows. The company has also experimented with pay-per-view conference events. Brimhall estimates that Novell averages nearly 35,000 external viewers of streaming marketing material, sales training material and other documents per month.

Novell uses Real Producer Plus to encode live and on-demand content. One Sun Enterprise 3000 server manages all of Novell's external video, while two Real-

Networks video streaming servers behind the firewall take care of internal broadcasts that are received by employees as far away as Germany and England.

To avoid bandwidth bottlenecks, Novell uses IP Multicast technology for internal broadcasting and delivers content at multiple bit rates. "We always do a 28K modem feed, a 56K modem feed, an ISDN feed of around 80K per second and a much higher-bandwidth version for a corporate LAN, around 200K per second," Brimhall says.

He adds: "When we did the first BrainShare conference, we actually overran our main Cisco switches because we had too much traffic. That was a good thing. It showed us what demand was and made us rethink our architecture for delivering streaming media. We reconfigured our switch and haven't had a problem since."

Brimhall estimates that Novell spent about \$250,000

Continued on page 41



# IMPLEMENTATION ISSUES

So your CEO has informed you he wants to flash his million-dollar smile weekly on every desktop across the WAN. Time to figure out if the network can support such an undertaking.

The process of serving streaming media across a network is made up of three basic components: stored digitized video on an archive server, a content manager software tool and a client-side viewer application. Several other related issues will also impact the success of a streaming media implementation.

## Server and content manager software

For most companies, this is a choice between the de facto standards — RealNetworks G2 Enterprise Server and Microsoft Media Server. The biggest difference here is cost. RealNetworks bills its media streaming packages on a per-client license. A pilot system costs \$5,000, which includes 100 user seats, with an extranet server capability for broadcasting up to 20 concurrent streams.

Microsoft includes this feature in the Windows NT Server 4.0 and Windows 2000 operating systems, as well as in all its client Windows operating systems, so it's essentially free.

Companies that want the most flexibility for streaming media may wish to implement both.

## The desktop client

RealNetworks RealPlayer and Microsoft Media Player offer similar playback options to the end user. Both utilities are free and handle a variety of video and audio formats. RealPlayer Plus can be purchased as a site license for firms that require extra features, such as a graphic equalizer to enhance audio and one-click access to favorite channels and clips.

One other important issue is the processing power of the desktop itself, says John Breen, vice president of engineering at Ameritech Data Networking Solutions. "If I have a 200-MHz workstation with a software-based codec, the video stream isn't going to be the problem. The problem will be the workstation. The CPU load of the codec function is important. Users can expect lower performance with lower speed processors," he says.

## Unicast or multicast delivery

Unicast streaming is a point-to-point transmission in which each end user is individually addressed and receives a dedicated video stream. Unicast makes the most sense when users will access different content at different times, such as in an archived video-on-demand system. However, the network must be scaled appropriately to support the maximum number of simultaneous streams.

If many people are watching the same program at the same time, unicasting the stream wastes network bandwidth.

IP Multicast is a better choice for live broadcasts or when several users will simultaneously receive the same streaming content. Instead of transmitting a separate stream for each user, the server sends out a single stream of content on a shared multicast

group address. Anyone interested in viewing it taps into the shared stream. Multicast streaming scales much better than unicast.

Breen recommends that companies interested in streaming media validate their router codes to make sure they support IP Multicast. "Most implementations of router code typically have this capability already — it's often just a matter of enabling that feature. Most Layer 3 switches support multicast as a default part of the routing, so the nice feature with companies that have moved from Layer 2 to Layer 3 switches is that they can also support some better efficiencies," he says.



## Traffic prioritization

An excess of video traffic on the network can lead to congestion, keeping other critical data from being delivered. Breen suggests that network managers look for switches that support 802.1p prioritization, which will allow them to assign data a higher priority in the queue than streaming content.

## Bandwidth requirements

Bandwidth needs for streaming media will be a function of the size of the streaming files and the number of users viewing content at any given time. "Most of our customers are using ATM backbones at OC-3 or higher, or gigabit backbones in the Ethernet community," Breen says. "We then look outside the backbone to the periphery switches to be able to deliver a minimum of 10M bits down to the desktop. If there will be a lot of shared hub usage, then we recommend they identify a station or two that will be the streaming station and only load the client software on that one station."

Encoding multiple versions of content compressed at different rates or limiting the stream to audio is only one way to utilize available bandwidth. In situations in which the network won't have enough available bandwidth to manage ongoing streaming needs or a large one-time Webcast, it's best to outsource the streaming media delivery completely or buy temporary bandwidth from vendors such as InterVU or Broadcast.com.

## Security

Access to streaming content behind a firewall can be managed at the server level with logon and password protocols built in to Windows Media Server and RealNetworks G2 Enterprise Server. However, keep in mind that "if you want to not only have logon and password, but then initiate an internal virtual private network, you can expect a severe delay in performance," Breen says.

## Replicating archived content at remote locations

Centralized organizations without many branch offices likely have ample capacity on the network to support a single archive server. However, when you send streaming content to remote offices, you must consider your WAN infrastructure and what other traffic is going over the WAN links, which are typically much slower than 10M bit/sec desktop links. To solve this bandwidth bottleneck issue, Breen recommends replicating on-demand content on remote servers, which lets users access content at faster local network speeds.

## Know the limitations of your network

Identifying your goals and priorities for streaming content and understanding streaming media limitations is essential to the success of any rollout.

"Most companies want to offer streaming video for company communications, financials, CEO broadcasts and so on. If that's the initial implementation, we really work with our customers to understand the impact at the workstation level, the network and the backside in terms of digitized recording archive servers," Breen says. If the priority is video streaming in an always-on capacity, strict attention must be paid to network sizing. And even with ample bandwidth there can be quality-of-service issues. "If the CEO thinks he's going to come through to every employee at 30 frames per second, he needs to realize there are 20 different things that can drop that signal down to four frames per second," Breen says.

To help pinpoint the strengths and weaknesses in a network, Breen suggests running a network modeling application early in the process. "In situations where a company would rather overlay streaming media on its existing network vs. building it up, modeling is something we highly recommend," he says. "These tools allow you to key in network parameters and play a constant 1.2M-bit stream to a variety of devices. Then you have virtual users request stored content over the network model so you can look at degradation points due to traffic flow. Sometimes the model will show there's no need to upgrade the backbone or where you can logically place stations at certain points for streaming." ■



Continued from page 39

to implement streaming technology in terms of hardware, software and video production equipment, but the savings realized have been impressive. The company is saving \$450,000 per year formerly spent producing and mailing technical videos to key partners and channel members.

And "for internal communications we figure we've saved anywhere between \$500,000 and \$1 million in travel and people time annually by delivering broadcast to the desktop rather than collecting people into meetings," he says.

Implementing streaming media at Novell has been so successful that the company plans to build a new studio to expand its capacity for creating content.

Brimhall advises other companies not to fear the transition to streaming media. "I understand a lot of network managers are concerned about the bandwidth that may be sucked up by this," he says. But Brimhall adds that even if going to streaming media requires a significant bandwidth upgrade, the savings will more than offset the cost.

## SAS offers video on demand

SAS Institute ([www.sas.com](http://www.sas.com)) has been using streaming media for almost three years, producing most of it in an 85,000-square-foot video production facility on its main Cary, N.C., campus.

"We recognize that video will be a part of everyone's



desktop solution, and if it isn't today it will be very soon," says Bill Marriott, director of SAS Video Productions. Early on, SAS experimented with video on the desktop, encoding MPEG versions of existing video and refining technical methods. Currently, the company uses a combination of RealVideo and Microsoft Media to make archived and live streaming content available to more than 6,400 employees in 19 global offices.

SAS' extensive video library contains more than 300 hours of previously recorded events, lectures, technical demonstrations, town meetings and training content accessible via the company intranet within the firewall. Remote users dial in to the intranet to access materials from a keyword-searchable database.

"If an account rep in France wants materials on data mining, he can enter 'data mining' as a keyword and instantly access all the archived content on that topic," Marriott says. "Users also register when they visit the site for the first time and identify topics that are of interest to them. As we add new video clips to the library, we can notify employees of new content."

SAS invested in encoding tools for RealVideo and Microsoft Media formats to give remote users a choice of viewers, but the company chose Microsoft Media for in-house content delivery because the necessary tools were already built in to existing NT servers, and the client-side player is free with Windows.

"We were more interested in the content than the delivery system. Video-qualitywise it was a tossup, so we went with the free option," Marriott says.

The company network can deliver IP Multicast within its world headquarters and hopes to expand its multicast capability to all U.S. locations next year.

Marriott is reluctant to attach a dollar figure to SAS' return on investment, but there's little doubt the company has realized huge benefits in shortened message-delivery times and global reach for corpo-

Continued on page 42

# STREAMING 101: THE BASICS

In general, streaming media refers to the ability to deliver video, audio and presentations, such as PowerPoint, that play immediately when accessed, without requiring a full download before playback.

Streaming content delivery falls into two main types: live multimedia broadcasts (often called Webcasts), or archived video and audio accessed "on demand" by users.

In simple terms, the process of getting from raw footage to streamed content works like this:

- An event is recorded.
- The content is edited, then digitized using video editing hardware and software.
- The digital video and audio content is encoded for streaming. The most widely recognized encoding standards are Microsoft Windows Media and RealNetworks RealVideo. Tools and software also exist to encode for Vivo, AVI, QuickTime and MPEG.
- The media file or live stream is stored on a host computer that has streaming media server software installed.
- A user clicks a link on an intranet page to request a video stream or accesses a database of stored streaming content.
- The host server delivers the digitized content to the end user, who watches it through a player utility (such as Windows Media Player or RealPlayer) that displays the media file on the desktop.

## Outsourcing may ease transition

Though a few larger firms may prefer to handle the entire process, there's ample opportunity to outsource production steps to third parties.



Companies that do not own video production equipment and have no desire to invest several thousand dollars in establishing a studio may hire an outside firm to light, film and capture individual events, and purchase edited, digitized footage ready for encoding. Encoders are readily available from RealNetworks, Microsoft, and third-party vendors, such as Adobe and Sonic Foundry, but service providers such as Encoding.com can manage the encoding

process and deliver a finished product in the streaming format you specify.

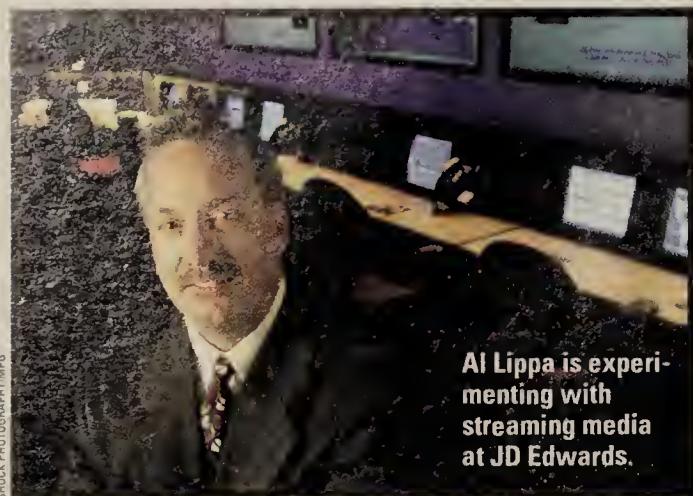
Content delivery could have a major impact on your network. Companies unprepared to deal with the additional network configuration and bandwidth issues, or those that would prefer to assess the effectiveness of streaming media on a smaller scale before spending thousands to upgrade a network, can tap service providers such as Broadcast.com, Network 24 and InterVU to host and deliver streaming content remotely, via a direct LAN connection or across the Internet.

The most significant caveat to the use of streaming media in place of traditional videotape or broadcast mediums is quality of playback. According to Optibase, a video hardware company, uncompressed video running full screen, full motion (30 frames per second) on a network could use up to 200M bit/sec at a sustained rate. Even an MPEG 1, Layer 3 encoded video eats up approximately 1.2M bit/sec.

Most companies do not have enough available bandwidth to sustain more than a handful of users at this rate, and excessive traffic on the network can result in a jittery picture and out-of-sync audio playback.

Network managers will need to experiment to find the best combination of video compression for playback quality. It may also be worthwhile to encode multiple versions of content compressed at different rates to address different bandwidth and company-wide traffic conditions, or to develop audio-only or multimedia presentations for delivery to remote locations using low-bandwidth connections. ■





Al Lipa is experimenting with streaming media at JD Edwards.

Continued from page 41

rate communications.

For example, key executives involved in a global branding effort recently met in the Cary, N.C., auditorium to deliver a status update.

More than 500 people watched the briefing live, and SAS made it available on demand to the entire work force. During the live presentation, employees could ask questions via telephone, fax or e-mail.

"Afterwards we were able to go back to our servers and know who connected, who watched it, when did they

watch it, and how much did they watch," Marriott says. He reports that within 24 hours, more than 5,000 employees around the world had viewed the briefing.

He estimates it would have taken up to a month to deliver the same project update via videotape, with no way to know if employees viewed the presentation.

## JD Edwards uses existing bandwidth

JD Edwards is testing the use of streaming media to transmit executive communications over the company's intranet to more than 6,000 employees in more than 50 offices worldwide.

The company is setting up a two-tiered system based on the premise that streaming media will be implemented without a major WAN upgrade.

Employees at the 12 hub sites around the world, which are connected to headquarters in Denver by high-speed frame relay links, will receive

audio and video at 108K bit/sec.

Employees at smaller offices will receive a 28.8k bit/sec audio stream.

Early testing has shown that a single server can host more than 800 simultaneous connections, and the Denver facility has four servers, which means the company is currently capable of delivering streaming media to 3,200 simultaneous users.

Using the Microsoft Site Server built into Windows NT, the company plans to replicate content to 12 Windows Media servers located worldwide. When end users visit the company intranet and request streaming media, the system will capture their IP addresses and redirect them to the nearest hub site, where they will connect to their local Windows Media server, thus saving on WAN bandwidth.

The company plans to use streaming media for its executive communications sessions, known as "Face to Face" meetings, and for investor relations conference calls. The company is developing an interactive, collaborative infrastructure for training and employee presentations, as well.

JD Edwards uses its in-house video

department to capture source content, but unlike Novell and SAS Institute, it does not do encoding. Al Lipa, JD Edwards' streaming media project manager, plans to bring encoding in-house in the future. "This will help us gain additional control and cut down on the time it takes to produce this product," he says.

JD Edwards is also in the process of upgrading legacy switches and routers, so it will be able to send multicast streams. The eventual goal is to produce live broadcasts, Lipa says. ■

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**K**eeping an eye on the performance of all the segments and carriers on today's networks can stress even the most nimble network manager. And forget trying to put together a legible report for management. Is there any relief in sight?

We think so. We found Ganymede Software's Pegasus 2.1 provided invaluable information for solving a lingering performance problem involving systems located on our enterprise network and across the Internet in Chicago.

Pegasus 2.1 is an automated testing and reporting application that combines the Pegasus Network Monitor and the Pegasus Application Monitor. Building on technology first developed for the company's Chariot product (see *NW*, Jan. 25, page 65), Pegasus supplies an enterprise management solution for network and application monitoring.

Pegasus 2.1 earns our World Class Award for its ability to provide valuable network and application performance statistics; its integration with other Ganymede products; and its strong performance, documentation and reporting abilities.

Duke University, where these tests were conducted, has been working with Pegasus from the initial development stage. We have also worked extensively with Chariot, which made it easier for us to understand and effectively deploy Pegasus 2.1.

The heart of Pegasus 2.1 is the Pegasus server. Installed on an NT Server or Workstation, the server pro-

vides a centralized repository for network and application statistics. It collects performance measurements gathered by the Network Performance Endpoints (NPE) and initiates alerts when thresholds are exceeded or net performance degrades.

Just such a degradation of network throughput gave us the opportunity to put Pegasus to the test in a real-life scenario. A research project was serving up image files through an Open Database Connectivity (ODBC) database on our campus. For security reasons, the ODBC database was protected by a proxy server at a different site from the database server.

Soon after the project became operational, some participants notified administrators that performance at several sites had degraded. This was of particular concern because one of the sites was the project's largest user, located at the University of Chicago. The project director asked to provide long-term throughput and response-time statistics.

Our enterprise network is divided into two distinct topologies: one heavily bridged, the other heavily routed. The database and proxy servers were located on the bridged section of the network. We installed NPEs on systems on both sides of the network and at the University of Chicago. We then defined a series of Pegasus connections — pairs of endpoints — and selected a test script for each connection that resembled the application traffic — specifically, one that sent files of many megabytes.

We configured Pegasus to provide us with a variety of reports, including Network Throughput Status and Network Throughput Summary. After

### Ganymede Software Pegasus 2.1

**Pegasus 2.1 earns our World Class Award for its ability to report valuable network and application performance information.**

24 hours of gathering data from scripts that ran every 15 minutes we had our answer. Throughput and response time to the Chicago site were fine. The problem was the section of the network between the proxy server and database server.

Located on a different section of the net, the proxy server's performance was poor because of network congestion between it and the database server. Users weren't aware of this; all they noticed was the slowdown. We moved the proxy server and database server to the same location and put them on an Ethernet switch. No more congestion.

These tests also demonstrated the power of the Pegasus reporting engine. The Pegasus server provides Web-based access to all reports, making report generation a hands-free task. You can also generate reports "on the fly." The product offers a wide variety of reports with various levels of information, from "Executive Overview" to in-depth statistics.

Effective use of Pegasus requires you to have a good understanding of network protocols and topology. For instance, we installed endpoints on several systems that were connected to the campus network through an asymmetric digital subscriber line (ADSL) service. During testing, we

## ScoreCard



### Pegasus 2.1

Functionality (40%)	9
Administration (35%)	10
Performance (10%)	9
Installation (10%)	10
Documentation (5%)	10
<b>Total score</b>	<b>9.5</b>

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. The World Class Award goes to products that earn 9.0 or above on the Scorecard.

## Ganymede Software's Pegasus 2.1 comes in a winner.

BY BOB CURRIER,  
NETWORK WORLD TEST ALLIANCE

## NetResults

### Pegasus 2.1

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[www.ganymede.com/html/Pegasus.htm](http://www.ganymede.com/html/Pegasus.htm)

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#### Pros

- ▲ Low-impact network monitoring and testing
- ▲ Results easily verified and accurate
- ▲ Wide variety of reports, from Executive overview to in-depth statistics

#### Cons

- ▼ Requires detailed understanding of underlying network for effective utilization
- ▼ Manually initiated reports revert to "stock" parameters

noticed significantly higher throughputs being reported than the ADSL lines were capable of providing. Other testing tools confirmed that the Pegasus report was not accurate.

We looked into the problem. Using the Pegasus script editor, we took a look at our test script. Out of the box, Pegasus loops through each script only once to minimize the impact on both systems and network. Our ADSL service provider uses frame relay to trunk traffic to our campus. The frame network was buffering data, and with only one iteration, Pegasus didn't have enough data to generate accurate results.

The only other glitch we discovered involved the reporting features. While Pegasus lets you define throughput measurement units as either K byte/second or K bit/second, these settings only apply to automatically generated reports. On-the-fly reports revert to the Pegasus default of K byte/second, and no method of defining a global preference was provided.

Nevertheless, we found Pegasus 2.1 to be one of the few "can't do without" tools in our kit.

*Currier is director of data communications at Duke University in Durham, N.C., and the 1998 Grand Prize winner in the Excellence in Campus Networking competition sponsored by CAUSE, a user group for computer professionals in higher education. He can be reached at [robert.currier@duke.edu](mailto:robert.currier@duke.edu).*

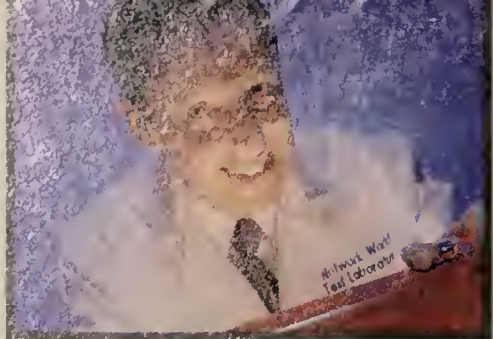
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## THE CART BEFORE THE HORSE

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# Cool Tools Quick takes on high-tech toys

Lee Schlesinger, Technology Editor

## AUTOMATED ASSISTANTS

**W**hen I travel, I hate being away from e-mail. That's how I get most of my business done. It's not always convenient to carry around a computer,

even a palmtop, to check e-mail.

Phones are always handy, however, and lately I've been testing two ways to keep up with e-mail using only a phone.

One is a product, the other is a service.

Gensoft's Mercury Mobile 1.0 is a Windows application that checks your Post Office Protocol 3 mailbox at regular

intervals and reads your messages to you over the phone using text-to-speech technology. It works with Telephony API-compatible modems and ISDN terminal adapters that can recognize phone tones. You can set the application to call you at one or two phone numbers when new messages are received, or you can dial in to your computer and retrieve messages on your own schedule.

You can customize the voice that reads out the messages. However, no matter how you set it, it sounds like a computer-generated voice.

If you want to reply to a message, you have three choices: yes, no or "Message received, I'll get back to you as soon as possible," all of which are activated with a touch-tone phone. The product does not allow you to customize the outgoing messages. You can, however, enable or disable the system remotely.

If you regularly receive messages in French, German, Italian or Spanish, you're in luck — Mercury Mobile can recognize and read the messages in those languages as well as in English.

The product's interface needs work. There's no way to tell the program to check for messages immediately when you dial in. Also, you can't delete a message using the telephone keypad — you can only set global options for deleting all messages after they've been played. When the program called me, I had trouble getting messages with a digital telephone keypad. However, analog was okay, and I didn't have the same problem when I dialed in to get the messages.

Mercury Mobile is well-suited to occasional travelers. Those who live on the road might do better turning to a service called Webley that not only reads your e-mail over the phone, but also takes calls and faxes and forwards them to you at designated numbers. It's similar to General Magic's Portico, which I looked at last year. But Webley makes better use of a Web site to configure the product. You can use the Webley site to synchronize and manage your contacts, view call records and initiate conference calls. Visit Network World Fusion (Doc Finder: 6023) and take a free month's test drive. ■

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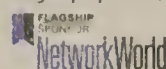
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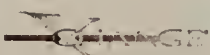
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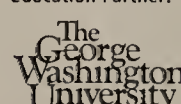
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### Net Results

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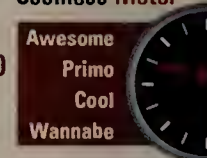
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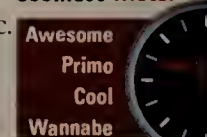
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# Management Strategies

Career Development, Project Management, Business Justification

## Acing the test

Here are some study tools that can help boost your certification exam scores.

BY DAVID RATHS

Network certification exams may be difficult, but there's a large test preparation industry dedicated to helping you succeed. Whatever type of professional certification you're pursuing, you'll find a variety of Web sites offering online exam simulations and message boards.

Most of these resources cost money to access, so it pays to try the free demos and shop around for the tools that best fit your needs and study habits.

A good starting point is MeasureUp's [www.measureup.com](http://www.measureup.com), which sells online and CD-based simulations of network exams. For instance, users can take six different simulations to help prepare for Certified Novell Engineer IntranetWare exams.

MeasureUp offers students unlimited access to the exams over a set period of time, depending on the field of study. Pricing starts at \$59 for 30-day access. The CDs in MeasureUp's catalog range in price from \$89 to \$119. However, the online version has proven far more popular, says Kevin Brice, CEO of MeasureUp in Atlanta.

Brice says about 11,000 users visit the site per day, and notes that one person accessed the site 182 times in six months. "She was biting off a little chunk at a time, and probably doing it in her spare time," he says.

Other sites offering simulated exams include [www.thelearningnetwork.com](http://www.thelearningnetwork.com) and [www.certificationzone.com](http://www.certificationzone.com). Along with the practice exams, Certification Zone, which has created "study zones" for the Certified Cisco Network Associate (CCNA) and Certified Cisco Internetwork Expert (CCIE), gives members a monthly tutorial covering major certification objectives. A six-month subscription to the CCNA Study Zone costs \$90. Nonsubscribers can take the practice exams for \$25 each.

Budget-conscious students will appreciate Cramsession.com, which offers free study guides and exam practice questions as well as news updates about IT certification programs.

Test preparation Web sites also offer a sense of community by allowing members to ask questions of others who are studying for the same exam. That

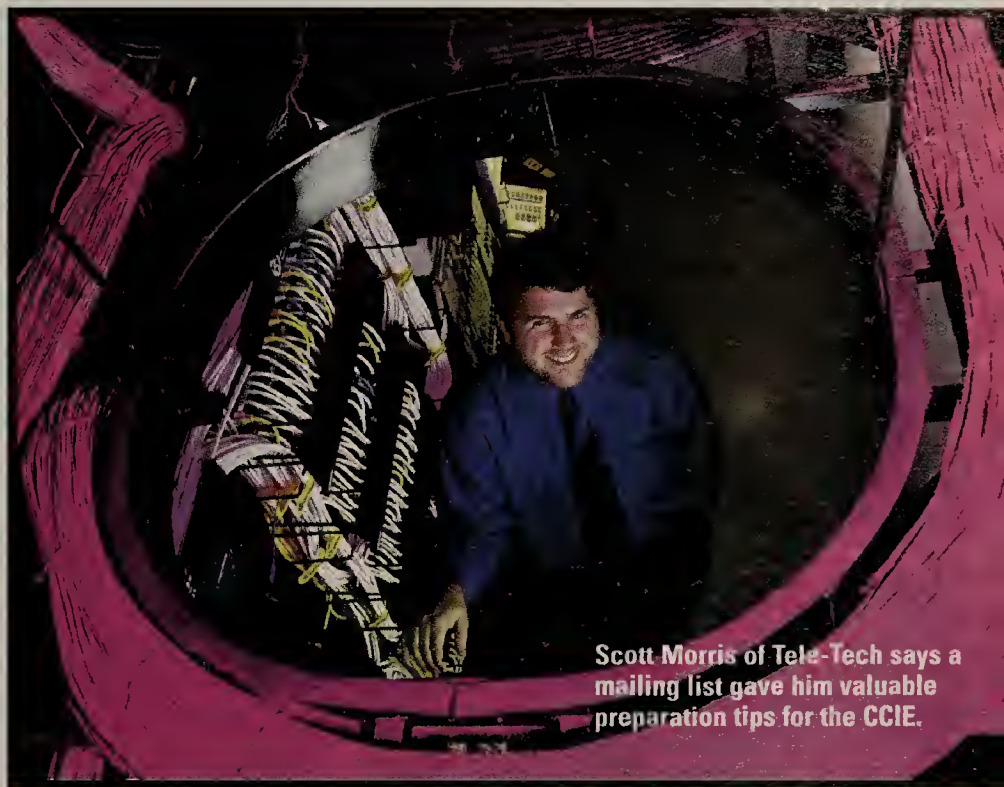
proved valuable for Scott Morris, IS director at Tele-Tech in Lexington, Ky. Morris passed the CCIE exam last May on his second try. He didn't spend much time with study guides or simulated exams. "I tend to attack things head-on," Morris says. "I bought a few routers, set them up in my basement and then tried to think up the most bizarre scenarios I could."

But Morris soon found working alone was difficult. "It was like operating in a vacuum," he recalls. He joined a mailing list at [www.ccprep.com](http://www.ccprep.com) and received valuable, time-saving answers there. Subscriptions to [ccprep.com](http://ccprep.com) start at \$19.95, which gives members access to 60 online questions and explanations, four lab scenarios and a wide range of forums.

Rocky Burrous, a consulting systems administrator to the State of Florida Office of Labor Market Statistics in Tallahassee, turned to practice exams on CD-ROM from Transcender ([www.transcender.com](http://www.transcender.com)) to study for NT 4.0 Server, Enterprise and Workstation exams. "They were very close to the real thing," he says.

Burrous, who now holds five Microsoft certifications and the Novell Certified Network Administrator, says the best thing about the exams was that they pointed out his areas of weakness. "When you got an answer wrong, they did a superb job of explaining the correct answer, and in most cases why the other answers were wrong," he says. Individual Transcender exams range in price from \$79 to \$179.

While taking practice exams and participating in



Scott Morris of Tele-Tech says a mailing list gave him valuable preparation tips for the CCIE.

ROLLO PHOTOGRAPHY

discussions with fellow certification candidates are helpful, neither can substitute for technical experience. "I don't want people to take a class, take a practice test, and then be able to pass a certification exam," says MeasureUp's Brice. "You should take our test to see where you're still weak."

Nevertheless, Brice says his company tries to make its questions more difficult than those on the actual exam. "I don't want them to have a false sense of security going in," he says.

While the Web is enabling new methods of learning and studying, it's also making it easier for students to disseminate answers. People coming out of exams such as the one for Microsoft Certified Systems Engineer certification perform a "brain dump": they jot down as many questions as they can, along with what they think are the correct answers and send them out over the Internet to others studying for the exams. "That's why the certification exams are becoming more plug and play," Brice says. "There are more break-fix scenarios with the stopwatch running."

Brain dumps wouldn't have helped Morris on the CCIE lab exams. "Cisco tells you to study everything, and they're not kidding. One person could get X.25, another ATM," he says. "Finding out what someone else's test was like wouldn't do anything but make you more paranoid."

Raths is a freelance writer in Kailua, Hawaii. He can be reached at [draths@lava.net](mailto:draths@lava.net).

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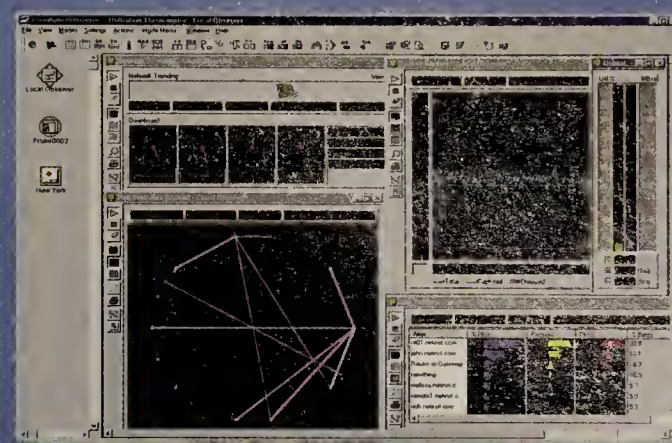
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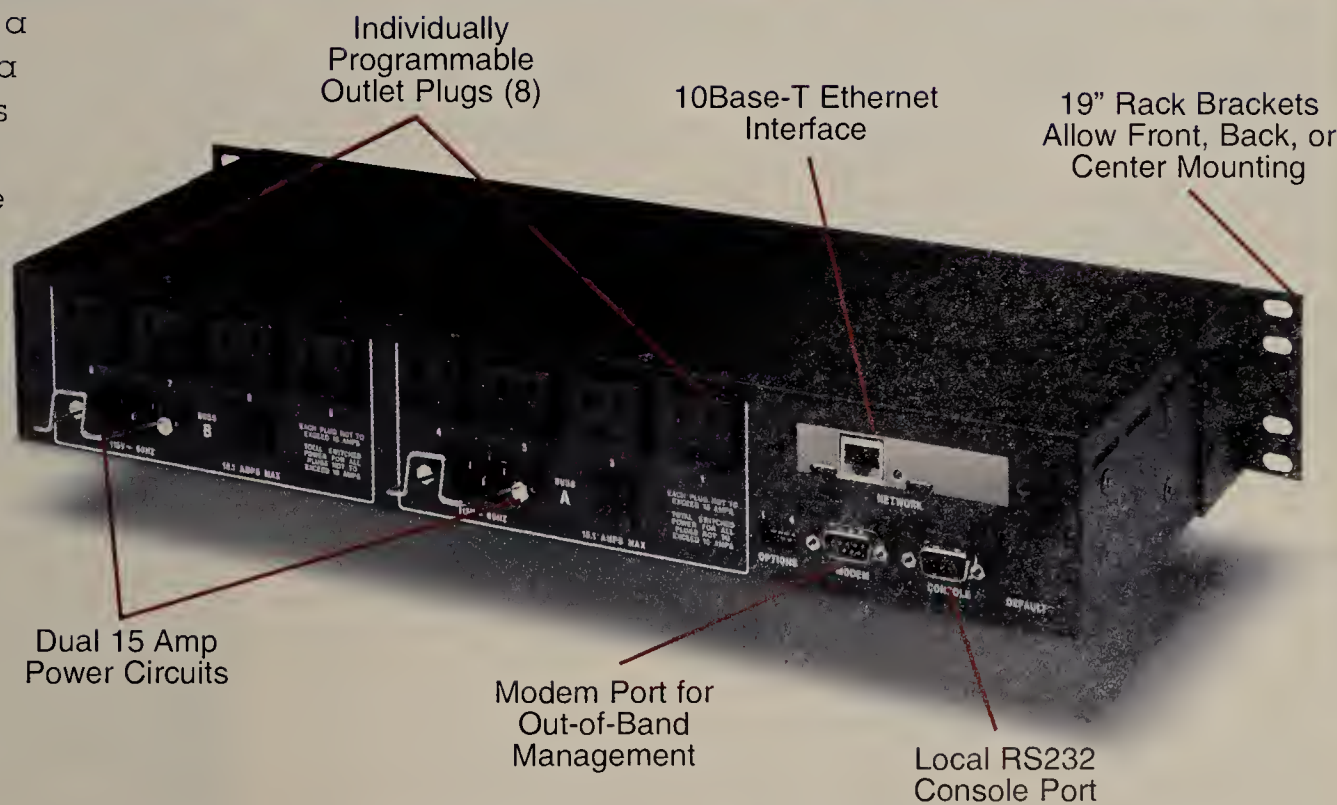
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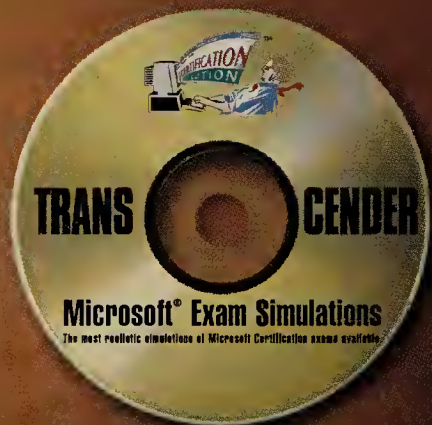
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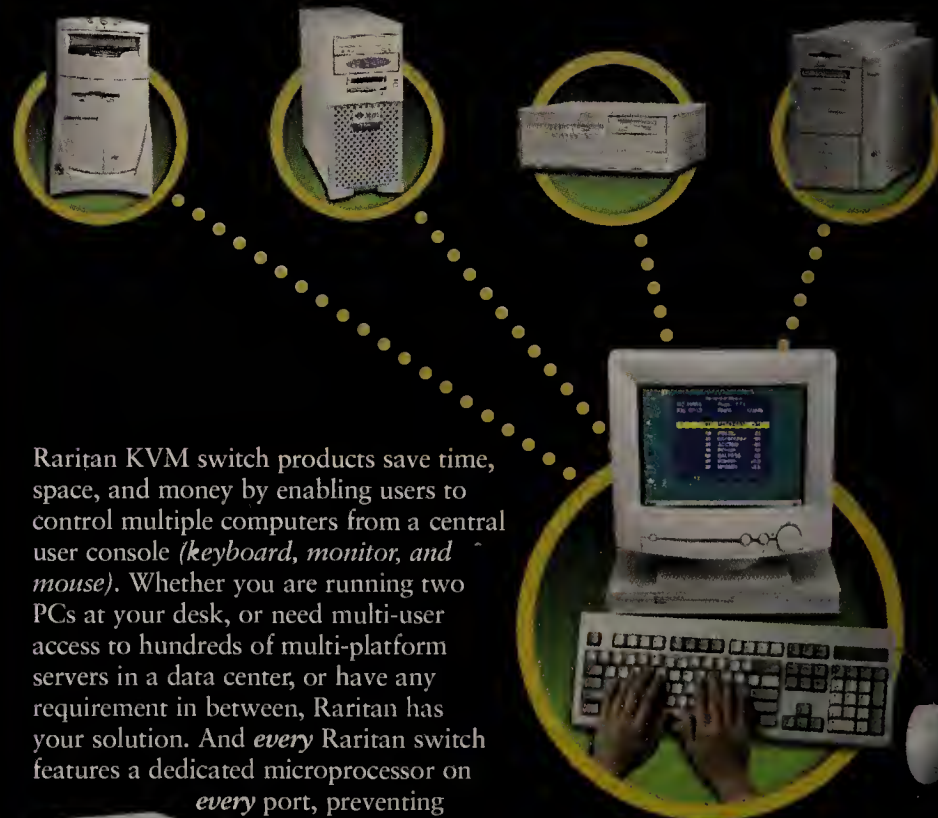


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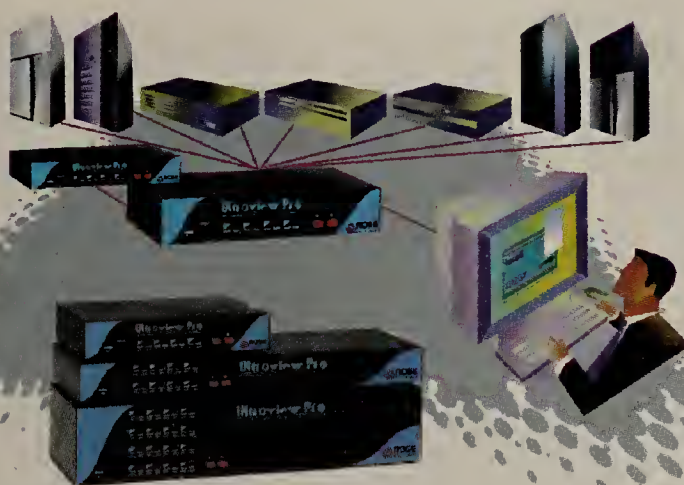
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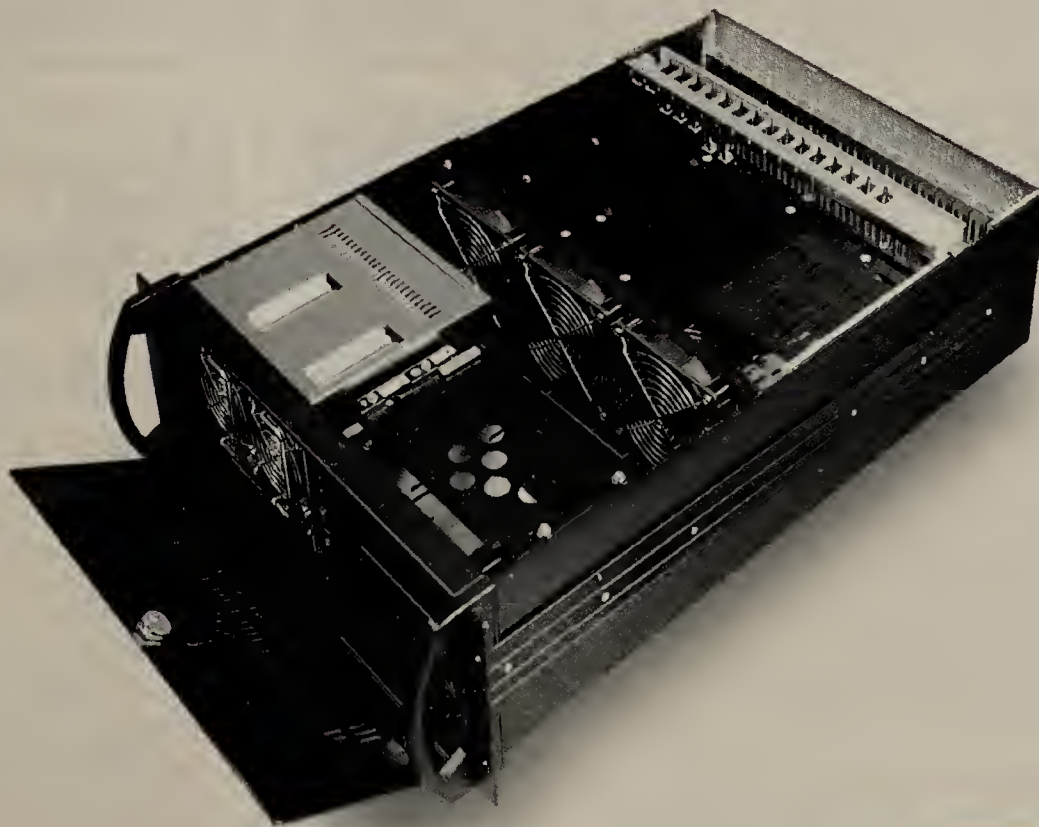
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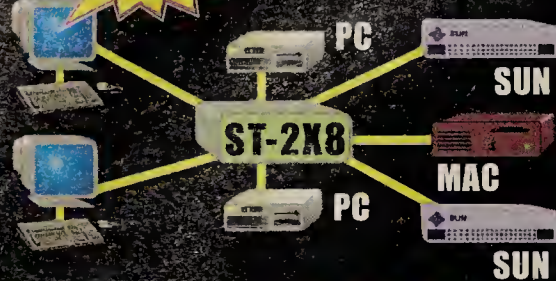


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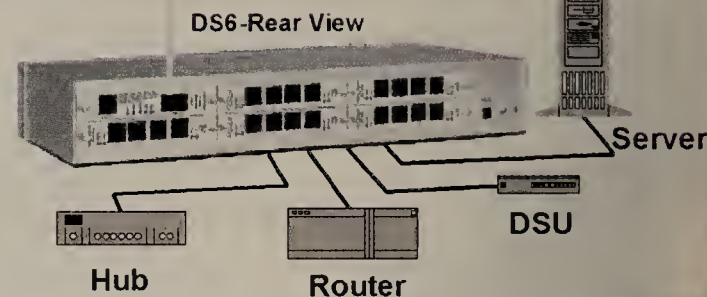
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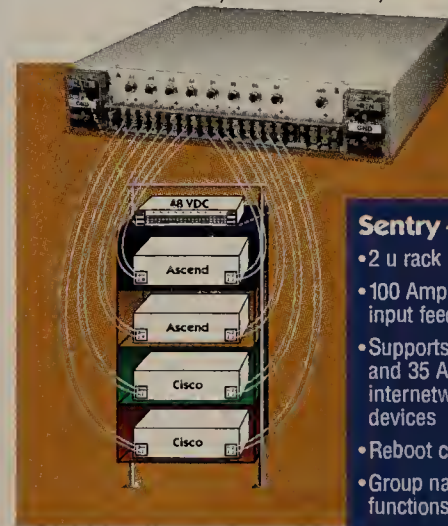
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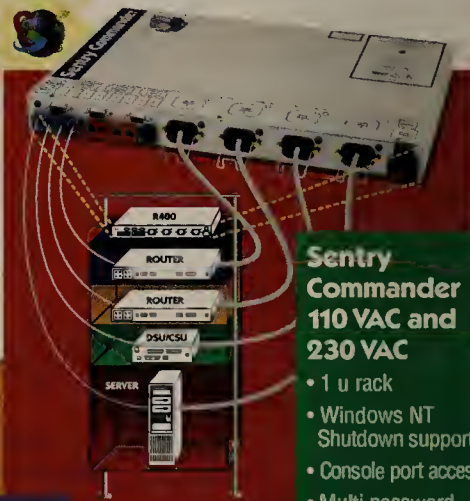
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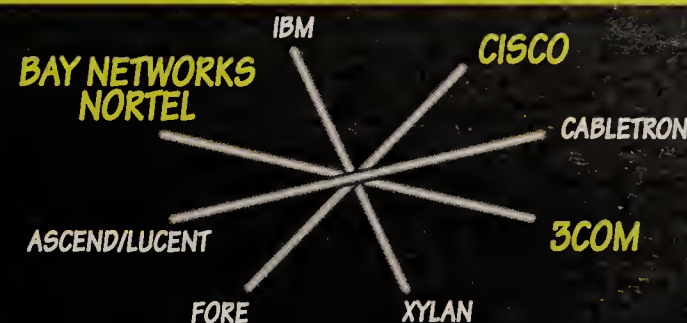
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Arrowpoint Communications	N.E.T.	
BMC Software	Netmoves	
Compaq	Netsolve	
Ganymede Software	Nortel	
GTE	Process Software	
IBM	PSI Net	
InstallShield	Top Layer Networks	
Intraware		

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\*Indicates Regional/Demographic

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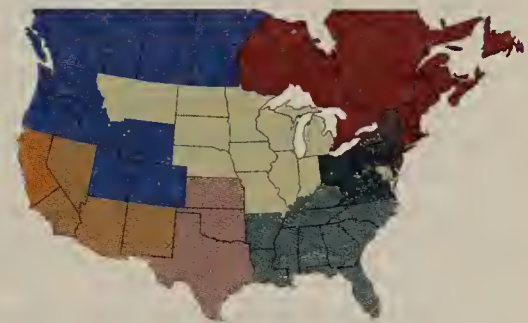
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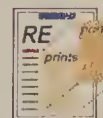


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eToys,  
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Internet activist group to launch what are known as denial-of-service attacks on the toy seller's Web site with the intent of bringing it down.

Denial-of-service attacks involve the flooding of a Web site with bogus requests that wind up blocking legitimate ones. Denial-of-service attacks can be launched using any of dozens of programs available in hacker chat forums and on the Web, including new tools that enable attackers to bombard Web sites with traffic generated by thousands of machines.

Activist group RTMark

ping floods.

RTMark also engaged the help of the Electronic Disturbance Theater — a hacker group claiming to attack sites only on behalf of social causes — to help cripple eToys or deface its Web pages.

"We're going to make an example of them," claimed Ray Thomas, a San Francisco-based accountant and RTMark's spokesman, describing how the group wants to "destroy" eToys. The group's Web site made available information, such as eToys' IP address, that would give attackers helpful ammunition to shoot eToys down.

Over at eToys, which has

eToys, says the online toy store considers the technical defenses it is using against the protest group's sabotage to be "proprietary."

Security professionals have a number of recommendations for coping with such attacks, which are identified by strange names such as SYN Floods, LAND attack, Ping bomb, Ping O'Death, Fraggie, Smurf and WinNuke (see graphic).

Security experts and e-commerce industry watchers believe denial-of-service attacks happen more often than they are reported. Most companies prefer not to acknowledge such attacks, often begging not to be identified in stories.

According to Paul Proctor, chief technology officer of CyberSafe's Centrax division, there are three categories of denial-of-service attacks.

One method involves flooding the line with ping traffic, or any "garbage to keep the router busy," Proctor says.

Using another method, an attacker can send malformed packets that give routers, firewalls or switches a kind of network indigestion.

Attackers also can scare off Web visitors by making them think something is wrong or dangerous about the site.

The discovery earlier this month of a new, more dangerous kind of denial-of-service tool on the 'Net has security pros sounding the alarm.

The new type of tool, which includes variations called Tribal Flood Network and Trin00, enables attackers to invade Web sites with bogus messages sent from many machines simultaneously. Until now, denial-of-service tools have limited attackers to launching a single ping flood, which wasn't usually enough to fill up the T-1 or T-3 bandwidth typically available at an e-commerce site, says Chris Claus, chief technology officer at Internet Security Systems.

But Unix-based Tribal Flood Network and Trin00 overcome that barrier by allowing a single user, by means of the appropriate client software, to launch a coordinated attack on a target from thousands of compromised machines in which the necessary server software has been installed.

"I call these compromised machines 'zombies' because of the intended use of them in denial-of-service attacks," Claus

■ **The new type of tool, which includes variations called Tribal Flood Network and Trin00, enables attackers to invade Web sites with bogus messages sent from many machines simultaneously.**

says. Attackers can remotely install Tribal Flood Network and Trin00 on unsuspecting hosts by exploiting buffer-overflow vulnerabilities or one of a handful of other vulnerabilities.

Claus says thousands of these ping-launching zombie machines have already been identified, many in university and government networks that are unprotected by firewalls.

This new type of ping flooding capability means that a single attacker at his desktop could masquerade as a huge group sending out disabling pings.

What if your site gets hit by a distributed denial-of-service attack? According to a recent CERT Coordination Center advisory, the target of an attack may not be able to rely on Internet connectivity for communications. CERT suggests that firms have alternatives to the Internet for data communications.

CERT also recommends that if you discover one of these distributed attack tools installed on your servers, realize that it might provide information useful in locating or disabling other parts of the distributed attack network. "We encourage you to identify and contact other sites involved," CERT says. ■

Y2K,  
continued from page 1

very defined procedures in place. People are not going to run into a problem and ask, 'Gec, what do we do now?'"

Not everyone will be so well-prepared, of course. For companies that don't have the luxury of huge IS staffs and Y2K budgets, there may be a need to summon help come the big night. We have provided some online resources (see graphic, page 57), with more available on the Network World Fusion Web site at [www.nwfusion.com](http://www.nwfusion.com).

**Command centers on call**

Prudential will monitor the global progress of Y2K's impact through a set of regional command centers, all feeding information to a main war room. Dec and her staff will see a constantly updated on-screen display of the status of key business applications at each site: when the programs are scheduled to run, when they're being tested, and when they're given a green light or flagged for problems.

At First Union Bank in Charlotte, N.C., staffers have been reassigned from non-critical systems to boost the Y2K team, and each business unit will be watching its respective applications, says Rich Alden, Y2K project manager.

Extra call center representatives will be on duty to handle an expected increase in queries from customers.

MCI WorldCom has grafted onto its trouble-shooting mechanisms new communication links to the Y2K command center, says Andy Sills, senior vice president for Year 2000.

For major customers, MCI WorldCom has created telephone bridges that will let everyone stay in touch. A mix of private and public Web sites will be used to post information.

The biggest companies have been Y2K-ready for weeks, even months. Smaller and some midsize companies, lacking the same resources, have relied on an array of consultants, service providers and other third parties to get them ready.

The large companies have

## Defending your e-commerce site

**What companies can do to thwart denial-of-service attacks:**

- Use intrusion-detection software to determine if operating systems, routers, firewalls or switches have known vulnerabilities to a denial-of-service attack. Some intrusion-detection software used behind firewalls will identify when certain attacks are occurring.
- Use vulnerability-assessment tools to ensure your servers are not being used as a platform for attackers to launch "distributed" denial-of-service attacks.
- Coordinate with your ISP on a strategy to deploy if your e-commerce site comes under attack, such as identifying and filtering out attacks originating at particular IP addresses.
- Adjust your router to filter out IP addresses that originate denial-of-service attacks — but be careful that you don't turn off legitimate IP addresses that attackers may appear to use through IP spoofing.
- Set up your firewall to disallow fragmented IP packets.

attempted to justify its attack on eToys' Web site by citing the eToys vs. etoy case as the victory of corporate greed over art and freedom of expression. Declaring a war of revenge against eToys, RTMark sought to rally the public to use a denial-of-service tool called FloodNet to saturate the eToys.com site with network

kept a great network-availability record during the holiday season, the e-commerce site showed only slight signs of problems. It slipped from 100% availability to 98% once the RTMark call for attack came, according to Internet online measurement service, Service Metrics.

Ken Ross, a spokesman for

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an additional resource: engineers from their key hardware and software vendors. These engineers will be at the customers' sites or can be called directly.

However, some vendors had to be convinced to go this extra mile.

"Some treated this as just part of their standard maintenance contract," Alden says. "With others, who weren't so willing, we had to say, 'Look, fellas: let's see what we can work out here.'"

A last resort will be bringing in a different vendor's equipment, says Mike Ackermann, manager of network planning and design at Blue Cross/Blue

Shield of Michigan.

"If our Cisco routers don't work, we'll bring in Bay [Nortel Networks] routers," he says.

The company has figured out which vendors it will fall back on if the worst happens. For instance, it uses Nortel Ethernet switches in the LAN. If those break down when the date rolls over, the company will go out and buy Cisco switches.

Blue Cross doesn't have spare equipment on-site, however, and Ackermann acknowledges that obtaining new equipment from suppliers may take a while. "If all hell breaks loose, we'll have problems for at least a few days," he says.

## Relying on online help

In many cases, large companies are relying on specialized Web sites to help see them through the long night.

First Union will participate

with 30 to 40 of the nation's largest banks in a confidential Web site where up-to-the-minute information, problem reports and solutions will be posted.

A number of other industry segments are taking a similar tack. ISPs will share information via a phone bridge and Web-based trouble-shooting system sponsored by the Internet Operators Group, known as IOPS.ORG. IOPS, in turn, will link to the main federal Y2K monitoring point: an information center hosted by the President's Council on Year 2000 Conversion.

Smaller companies, though lacking the resources of the giants, still expect the night to pass with few problems.

"There is very little that we believe needs to be done internally — other than a full backup of all our systems — before turning out the lights Dec. 31," says Rick Bullotta, vice president at Light-hammer Software Development in Malvern, Pa.

Others made a point of building their nets with newer, Y2K-compliant products. Arlington Industries, a Libertyville, Ill.-based distributor of imaging supplies, is confident that its 150-node network will work smoothly because all of the company's servers and PCs are less than two years old.

"I'm confident because I built this network," says network administrator Chris Kozlov. "Every piece of hardware and software, I put there."

Kozlov will run his regular year-end backup Dec. 31 and then make sure all PCs are turned off. The servers will stay on, but Kozlov says he is considering turning off the Secure Computing firewall to prevent virus infection from the Internet. He's not planning to stay overnight, but will come in Jan. 1 to test the systems.

Others have arranged to call engineers at their key vendors. Greenebaum, Doll and McDonald, a Louisville, Ky., law firm, will have specific Microsoft and Novell technical support personnel on call all New Year's weekend.

"We have their home phone numbers," says Mandi Turner, manager of network services.

Turner says the law firm will back up its entire network of 35 servers and 400

# Nonstop Y2K News

... direct from Network World Fusion!

Why spend New Year's alone when you can spend it with us? That's right. Network World Fusion will be working straight through the crucial Y2K turnover, telling you which systems made it, and which didn't.

And if your system breaks down, turn to our resource pages for help. Look for:

- Breaking Y2K news.
- An exclusive forum where IS pros will share their experiences — and their advice.
- A daily e-mail newsletter, NetFlash, that will deliver the latest news (sign up at DocFinder 3850).
- And loads of Y2K links.

www.nwffusion.com

## Y2K Resource Center

Here is a sampling of useful sites:

### Key hardware vendor sites

**3Com** [www.3com.com/cso/y2kweb.nsf/home+page?openform](http://www.3com.com/cso/y2kweb.nsf/home+page?openform)  
**Cisco** [www.cisco.com/warp/public/752/2000/contingency.html](http://www.cisco.com/warp/public/752/2000/contingency.html)  
**Compaq** [www.compaq.com/year2000/](http://www.compaq.com/year2000/)  
**Dell** [www.dell.com/us/en/dhs/topics/y2k\\_index.htm](http://www.dell.com/us/en/dhs/topics/y2k_index.htm)  
**Nortel Networks** [www.nortelnetworks.com/corporate/year2000/](http://www.nortelnetworks.com/corporate/year2000/)

### Key software vendor sites

**Computer Associates** [www.cai.com/2000/](http://www.cai.com/2000/)  
**McAfee** [www.mcafee.com/centers/y2k/](http://www.mcafee.com/centers/y2k/)  
**Microsoft** [www.microsoft.com/technet/year2k/](http://www.microsoft.com/technet/year2k/)  
**Novell** [www.nwconnection.com/dec.99/y2kd9/index.html](http://www.nwconnection.com/dec.99/y2kd9/index.html)  
**Sun** [www.sun.com/y2000/](http://www.sun.com/y2000/)  
**Symantec** [www.symantec.com/y2k/y2k.html](http://www.symantec.com/y2k/y2k.html)

### Key carriers and ISPs

**Ameritech/SBC** [www.ameritech.com/y2k/index.html](http://www.ameritech.com/y2k/index.html)  
**AT&T** [www.att.com/year2000/](http://www.att.com/year2000/)  
**Bell Atlantic** [www.bellatlantic.com/year2000/](http://www.bellatlantic.com/year2000/)  
**BellSouth** [cluser1.bellsouthonline.com/year2000/](http://cluser1.bellsouthonline.com/year2000/)  
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[www.wcom.com/about\\_the\\_company/year\\_2000\\_compliance/](http://www.wcom.com/about_the_company/year_2000_compliance/)  
**PSINet** [www.psinet.com/legalinfo/y2k\\_statement.html](http://www.psinet.com/legalinfo/y2k_statement.html)  
**UUNET**  
[www.wcom.com/about\\_the\\_company/year\\_2000\\_compliance/uunet\\_y2k/](http://www.wcom.com/about_the_company/year_2000_compliance/uunet_y2k/)

### Miscellaneous sites

**Year 2000 Information Center** [www.year2000.com/](http://www.year2000.com/)  
**Department of Energy's Y2K site** [www.doe.gov/y2k/index.htm](http://www.doe.gov/y2k/index.htm)  
**Y2K compliance database** [www.y2kbase.com](http://www.y2kbase.com)  
**Y2K user groups** [www.year2000.com/y2kusergroups.html](http://www.year2000.com/y2kusergroups.html)  
**Y2K News Network** [y2knews.com/index.html](http://y2knews.com/index.html)  
**Y2K Resource Center** [www.lawpublish.com/y2k-hot.html](http://www.lawpublish.com/y2k-hot.html)

For more sites, visit [www.nwffusion.com](http://www.nwffusion.com) and enter DocFinder 6035.

desktops, which span six regional locations, on New Year's Eve. Then everything will be shut down.

About 10 staff members will come to work on Saturday to boot up the network and make sure the systems and applications are working. The firm doesn't open again until Jan. 4, so there should be time to fix any problems.

"We've spent a fair amount of time on the Web site of every one of our manufacturers. We've checked every server and every driver. We ran tests on every workstation," Turner says. "We feel pretty sure that everything we have is Y2K-compliant."

In case something goes wrong, the firm keeps a spare of every major piece of hardware on the network. IT staffers have been issued cellular phones so they can keep in contact should the telephone system go down.

Some experts believe that all these contingency plans, while prudent, are unlikely to be implemented.

"My gut feeling is that Y2K will be a yawn in the U.S. and Western Europe," says Tom Oleson an analyst at International Data Corp. in Framingham, Mass.

While he believes all companies will experience problems of some sort, he says most will be so minor they can be ignored, with the balance correctable over the course of days or weeks.

Not surprisingly, some IS professionals are sick of the Y2K hysteria and the relentless drive to prepare.

"Come New Year's Eve, all anyone is going to need is a bottle of champagne," says one systems administrator who preferred not to be named.

Senior editor Jeff Caruso, Network World Fusion Managing Editor Sandra Gittlen and Network World Fusion Producer Marlo Matasko contributed to this story.

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## What I want for Christmas

Dear Santa,

I've been a good columnist this year, and I deserve lots of presents. I've handed in my columns on time, I've been cooperative with all of my editor's suggested changes (even though you and I know that I have always been right), I've made a few people laugh, and I've responded to a huge amount of mail. I've also stopped saying "but I digress" and using fake XML tags for emphasis.

On the minus side, I've enraged a few people (I loved the response posted to a *Network World* online forum that began, "You are an idiot") and got enraged myself over a number of issues that I should

have been more sanguine over.

On balance, I've been more nice than naughty, so might I suggest that I deserve a seriously good Christmas. It's not like I'm asking for much...

**Gift 1:** I know I've been beating this particular topic to death over the past few months, but

could I please have a useable version of Windows? I'd trade all other presents to get just this one.

I don't believe the statistic that I read some months ago — that the average user reboots four times per week. I reckon that should have been four times per day, although four times per hour would come as no surprise. I just want to never have to reboot to install software, never have to track down corrupted DLLs and...

**Gift 2:** ... not have the display of my HP Pavilion 8485Z running Windows 98 freeze whenever I try, for example, to save a PowerPoint presentation.

That's honestly what happens — the PC is still running, but the display doesn't get updated. I've applied every update and patch I could find for video drivers, Office 2000, the operating system, you name it. But every

time I use PowerPoint (and occasionally other applications), I still wind up with a frozen screen. Have you ever tried to shut down a PC with the screen off? I have to hit control-alt-delete and then guess from the flashing of the disk drive light what the software is doing. Honest, there are times when I could drop-kick the damn system.

**Gift 3:** Can I please hear no more about the Department of Justice (DOJ) antitrust suit against Microsoft? It has really gotten stale, and unless the press can find something interesting about Bill himself, like his days of gunrunning to Castro or his previous life as an exotic dancer, I say let's move on.

Yes, I know Bill is the anti-christ and we will ultimately blame the collapse of civilization as we know it on him, but I'd prefer it if we stopped talking, did something about it and moved on. After all, this is Internet time, and Internet time waits for no bureaucracy.

**Gift 4:** A faster Internet connection. I have DSL, but what I really want is something more like OC-48. I'm not being too greedy, am I?

**Gift 5:** This is a minor request: Stop IBM from using those ads with the skinny guy holding the "That's the software IBM makes" placards. They are, for some reason, damn irritating.

**Gift 6:** Please give Novell a marketing department.

**Gift 7:** While I'm being generous, give a clue to the politicians and all others who sound off about the big, bad Internet. I have written extensively on the topic of how politicians and a host of others who don't get it cite the Internet as the cause of everything from violence to bad breath. Like the Microsoft-DOJ thing, it has gotten stale. Perhaps you could help me start a "Don't blame the 'Net" campaign.

**Gift 8:** Another year writing "Backspin."

Thanks Santa, and Merry Christmas to all.

*Mince pies to [nwcolumn@gibbs.com](mailto:nwcolumn@gibbs.com)*



MARK  
GIBBS

The latest on the  
Internet/intranet industry

**Putting up with spam** from scam artists, porno pushers and clueless PR professionals may be unavoidable, given the limits of technology and the law. But shouldn't **American Express** know better than to send me spam... especially at work?

"Now through Dec. 31, you don't have to search all over the Internet to find terrific deals," the breathless missive promises. A click on a link will whisk me straight to scads of bargains from such name-brand merchants as "Dell, Toysrus.com, Eddie Bauer, ZanyBrainy.com, FTD.com, OfficeMax.com and The Sharper Image."

Perhaps these seven merchants believe I will not consider them spammers if their solicitations are riding the coattails of an e-mail from a generally respected outfit such as American Express.

If that's what they believe, they are indeed zanybrainy.

Granted, the spam from my corporate credit card issuer to my corporate e-mail account did include instructions for requesting that my company and I be spared from future nuisances. But why should I have to use company equipment and company time to fend off unwanted ads from merchants hawking clothes and flowers and whatever the heck it is that ZanyBrainy.com sells? This so-called opt-out option has always been nothing but a cop-out for merchants that want to send spam and still claim to be responsible Internet citizens.

Antispam crusaders have long feared the day when mainstream retailers decide that the old taboos about unsolicited commercial e-mail no longer apply. That day may be upon us.

**Someone is finally getting serious** about using the Internet to conduct statistically valid surveys of the general population, as opposed to merely polling Web-heads with too much time on their hands.

Palo Alto start-up **InterSurvey** — backed by \$42 million from **Oak Investment Partners, Alloy Ventures** and **Stanford University** — is building a pool of 250,000 survey subjects chosen randomly by telephone number. Each participating family will receive free hardware, Internet access and tech support in exchange for volunteering demographic data and the time necessary to answer a survey per week on topics commissioned by InterSurvey's clients.

Because the participant pool will be randomly chosen — as opposed to self-selected — InterSurvey will have overcome the primary objection to current online polling techniques, i.e., that they merely measure the opinions of people who enjoy filling out Web forms.

A complete description of the methodology can be found at [www.intersurvey.com/Press\\_Room/Methodology.html](http://www.intersurvey.com/Press_Room/Methodology.html).

Of course, providing all of that free stuff means big-time overhead, and maintaining a high level of participation may prove troublesome, but InterSurvey appears to have the right answers to the right questions.

**Buzz has long held a soft spot** for charitable efforts that promote literacy: After all, if people don't read, journalists don't eat.

One such effort underway this holiday season can be found at [www.hotaauthors.com](http://www.hotaauthors.com). In exchange for a donation of \$1 to \$10, visitors are able to access previously unpublished works of a half-dozen famous authors, including **Stephen King, Mary Higgins Clark, Jackie Collins** and **Stephen Ambrose**. Proceeds will benefit Literacy Partners, a nonprofit organization dedicated to raising literacy rates among adults.

The site also demonstrates technology from **Reciprocal, Inc.** that provides what the company calls digital rights management (DRM). The technology lets those visiting the site read and print — but not save — the works of the six authors, the company says. Publisher Simon & Schuster, a co-sponsor of the site, has a material interest in seeing that DRM is more than just another acronym, given the difficulties of protecting copyrights on the 'Net.

A good cause and cutting-edge technology: What's not to like?

*Keep the spam to yourself, but please send Internet news tips and gossip items to [buzz@nw.com](mailto:buzz@nw.com).*

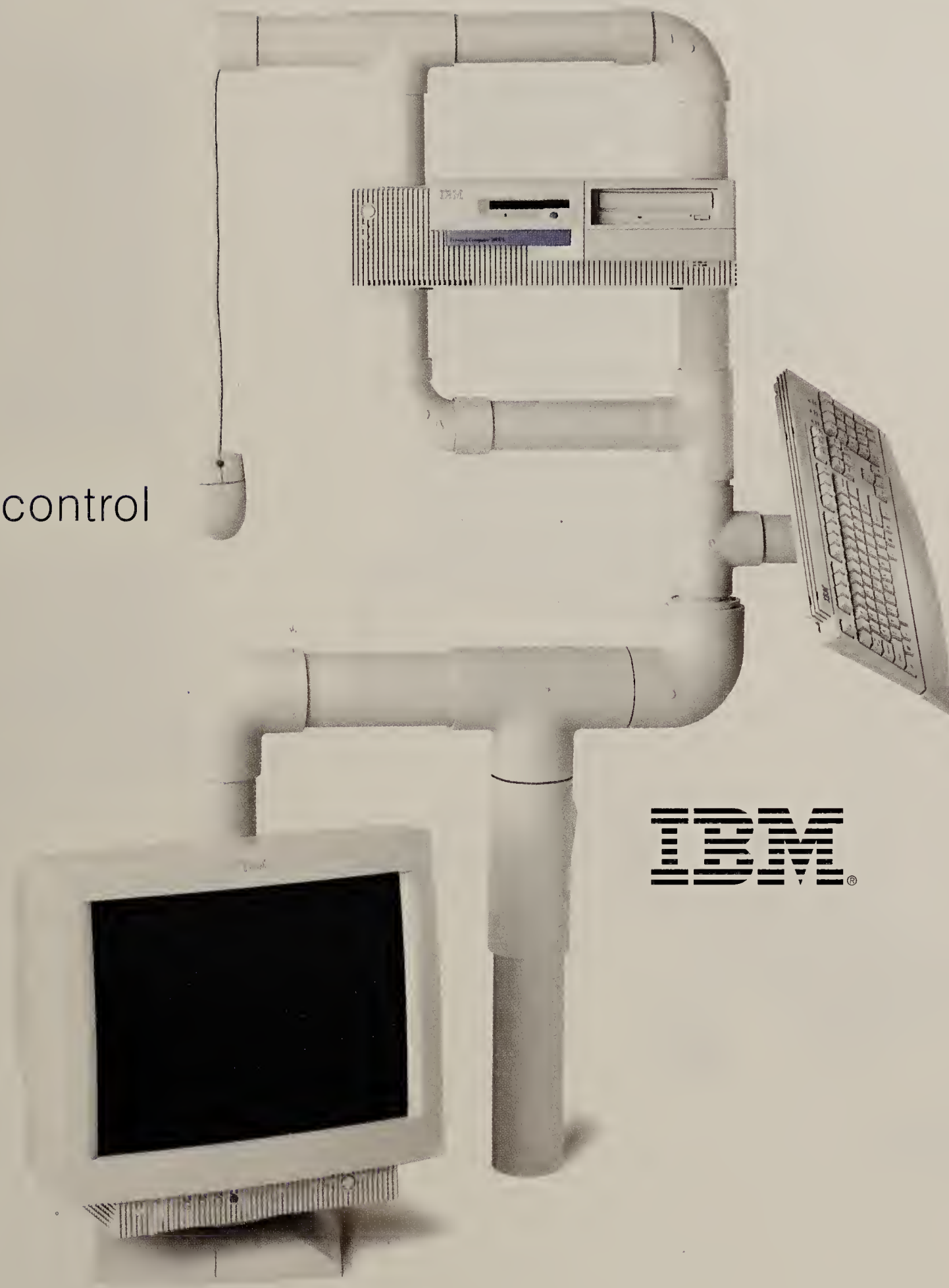


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